

FIG. 1

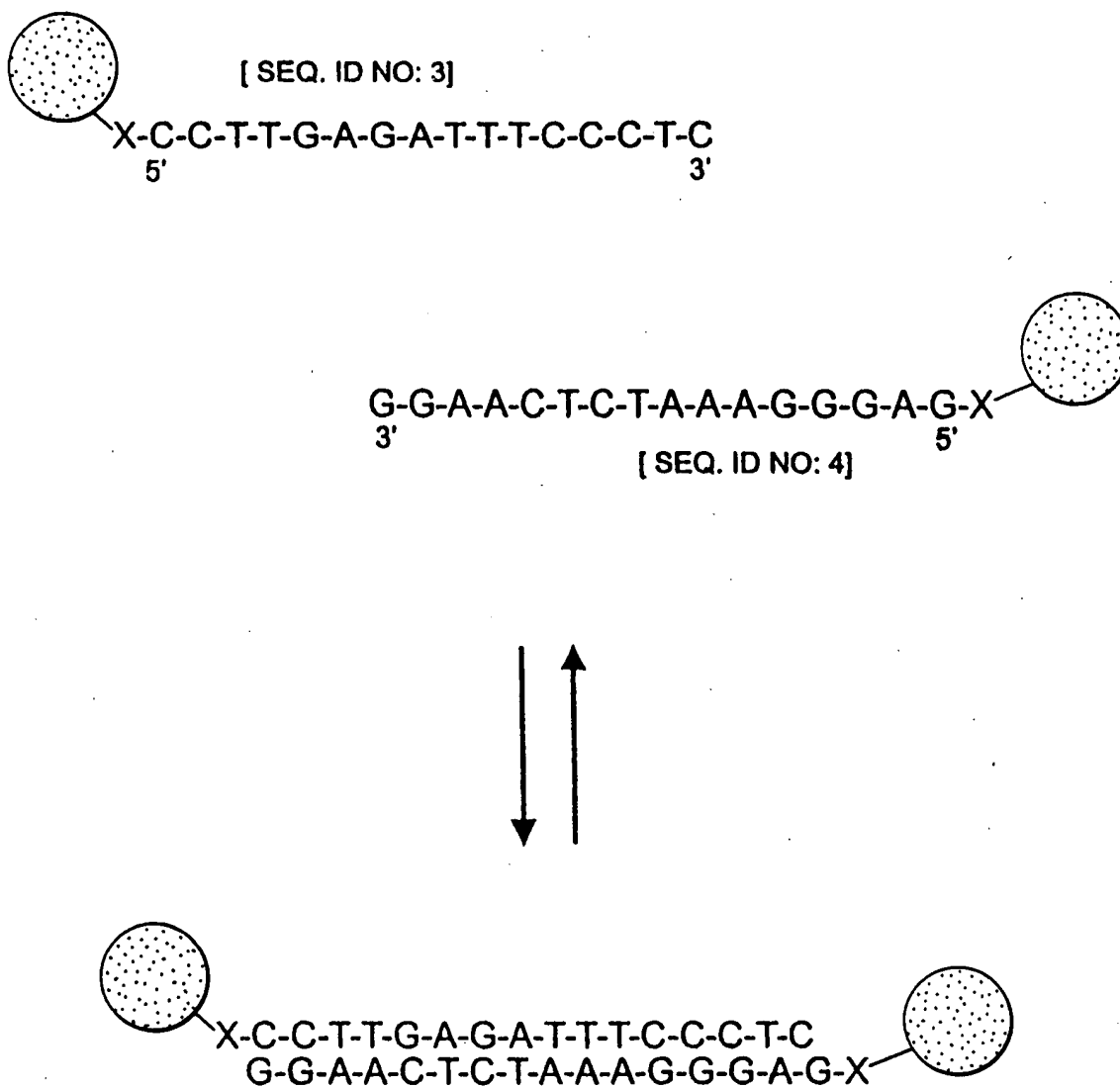


FIG. 2

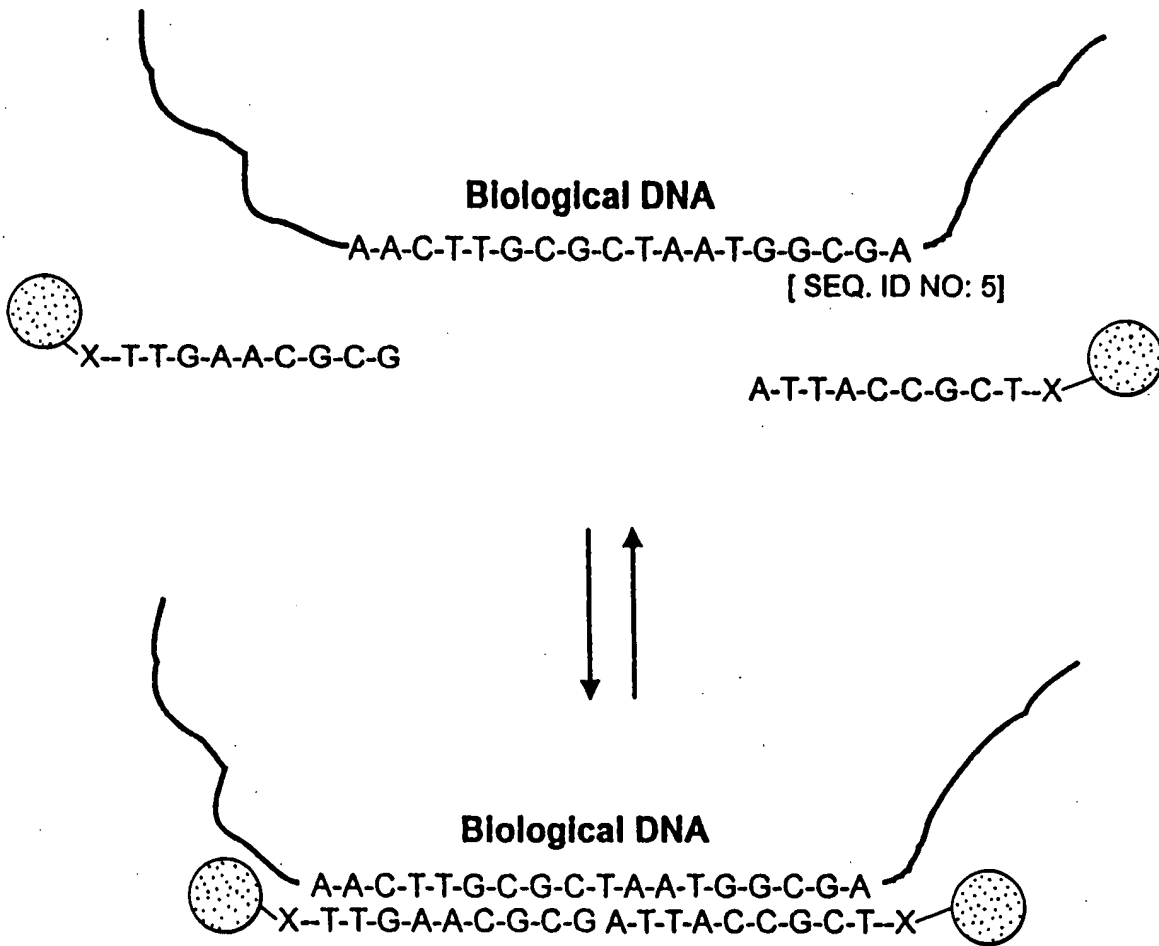
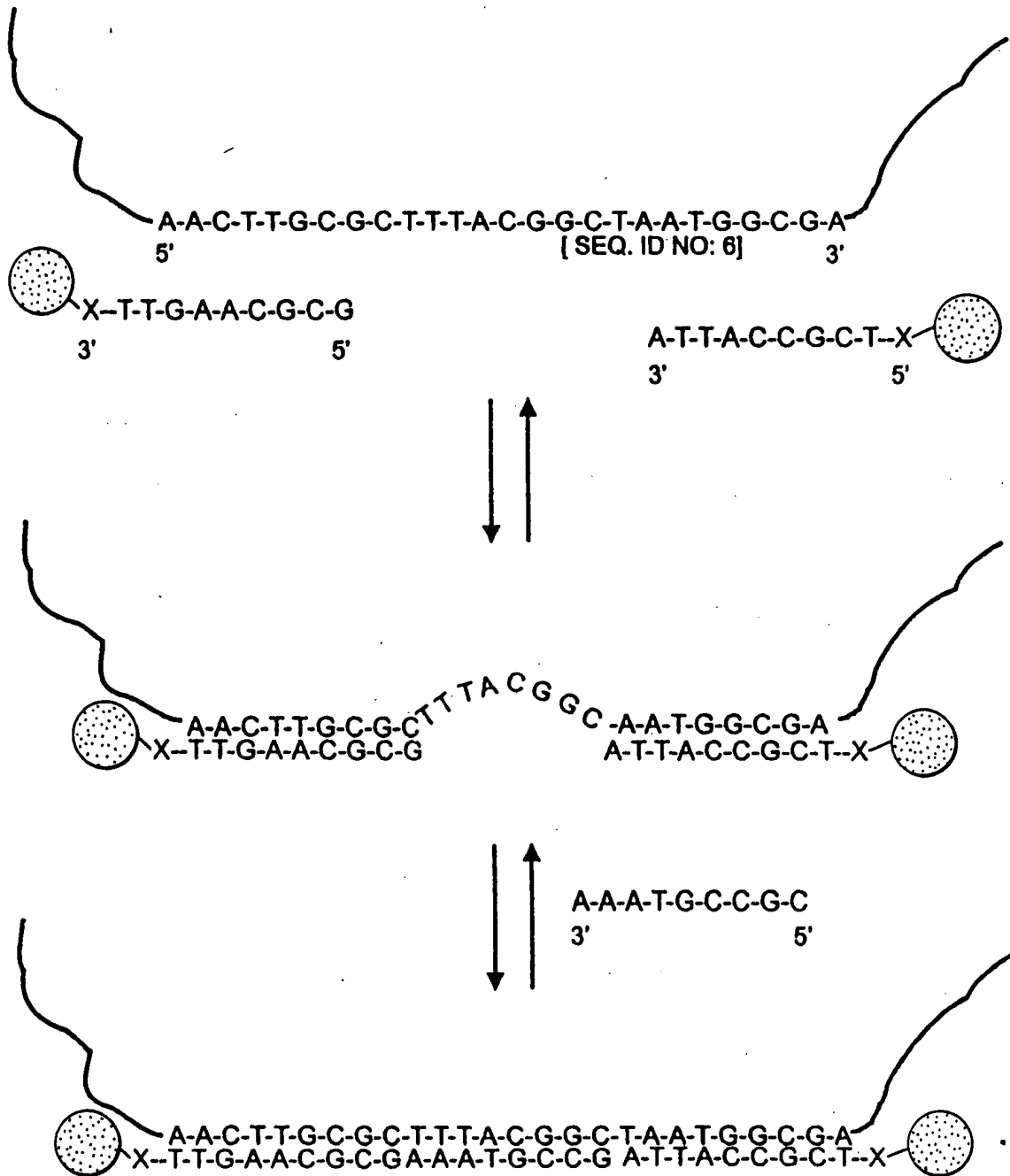


FIG. 3



**FIG. 4** Linking oligonucleotide  
 5' A-T-G-G-C-A-A-C-T-A-T-A-C-G-C-G-C-T-A-G 3'  
 3' A-T-A-T-G-C-G-C-G-A-T-C-T-C-A-G-C-A-A-A 5'  
 [SEQ. ID NO: 2] [SEQ. ID NO: 1]

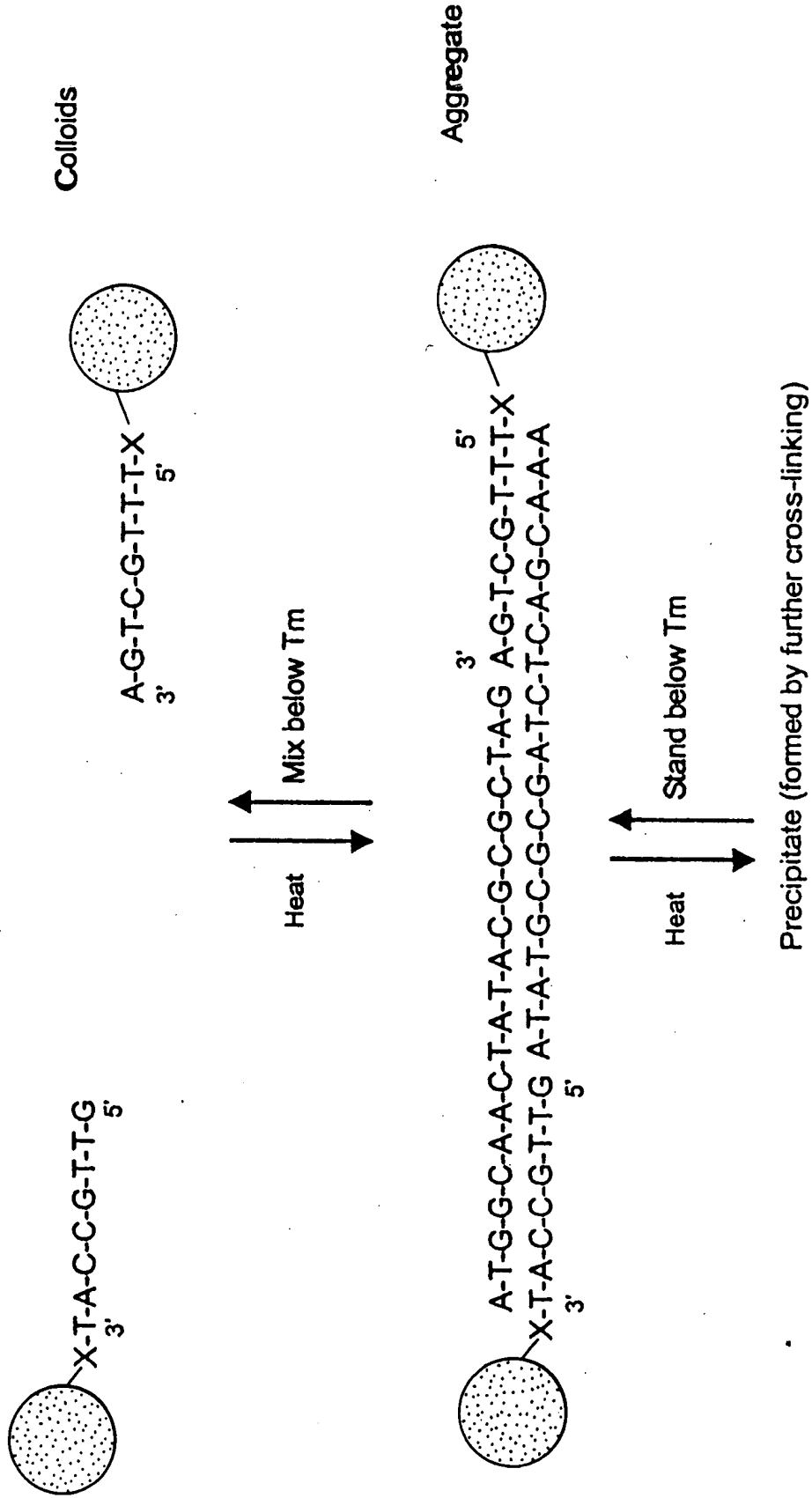
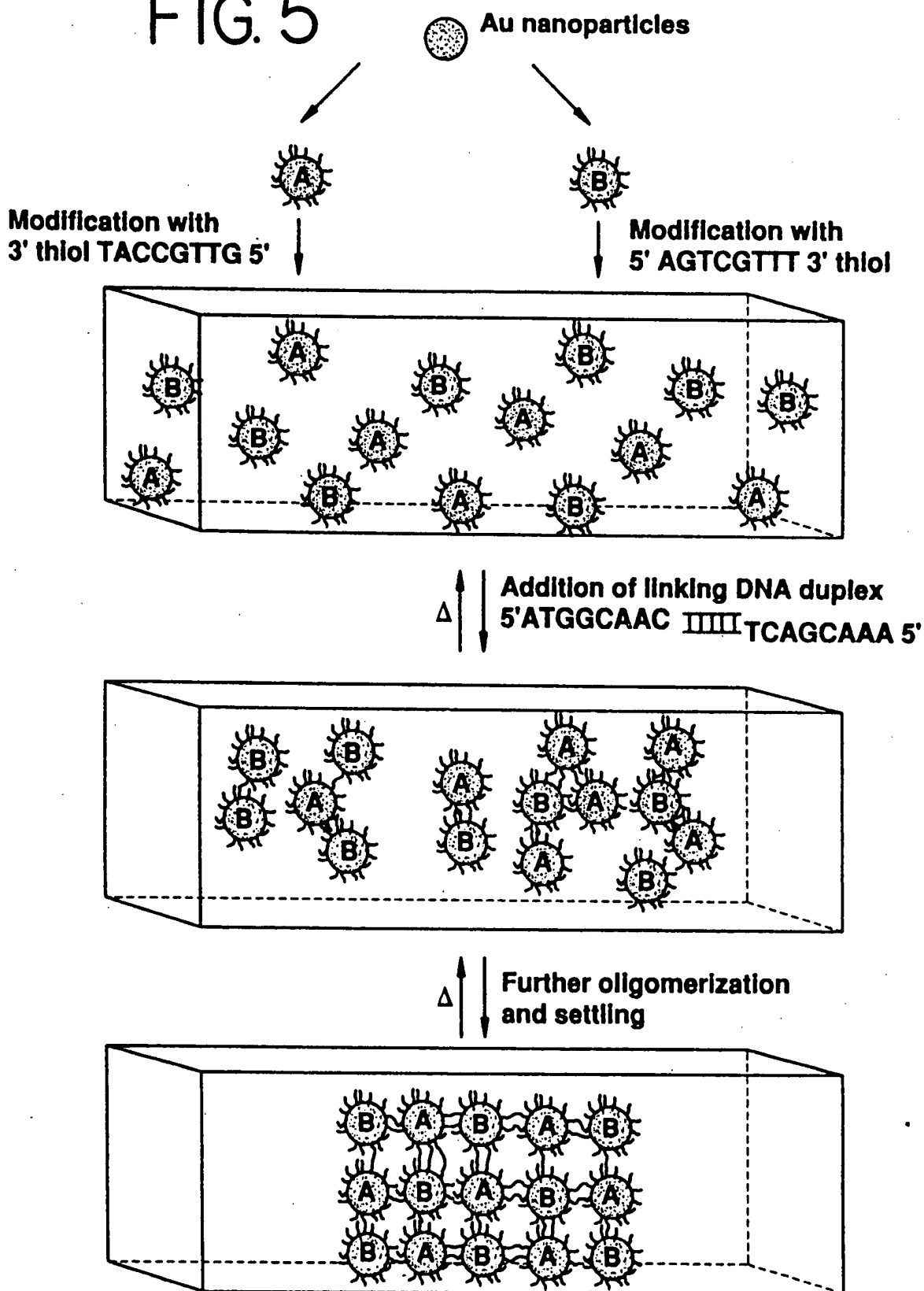


FIG. 5





6/47

FIG. 6A FIG. 6B FIG. 6C



FIG. 7

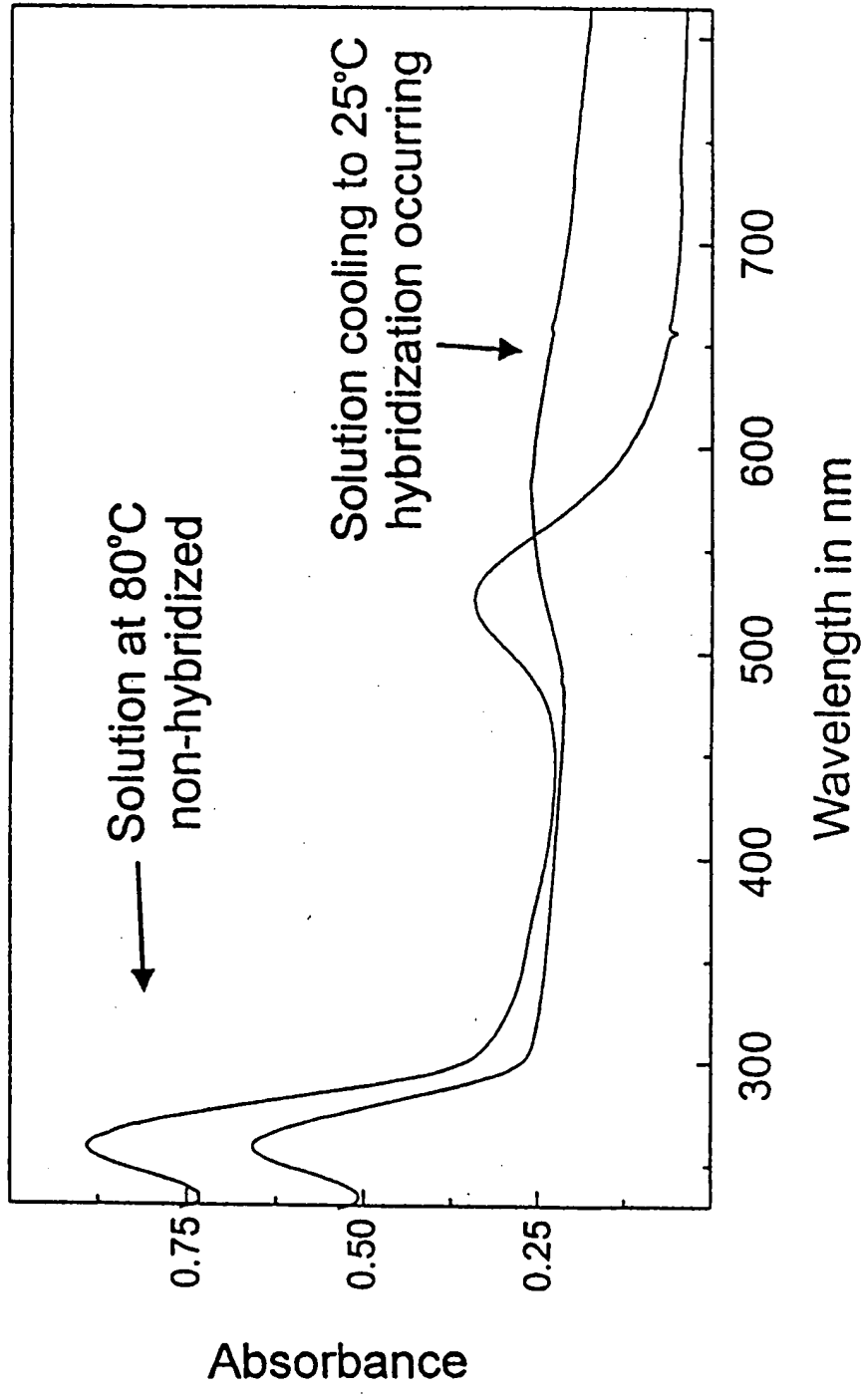


FIG. 8B

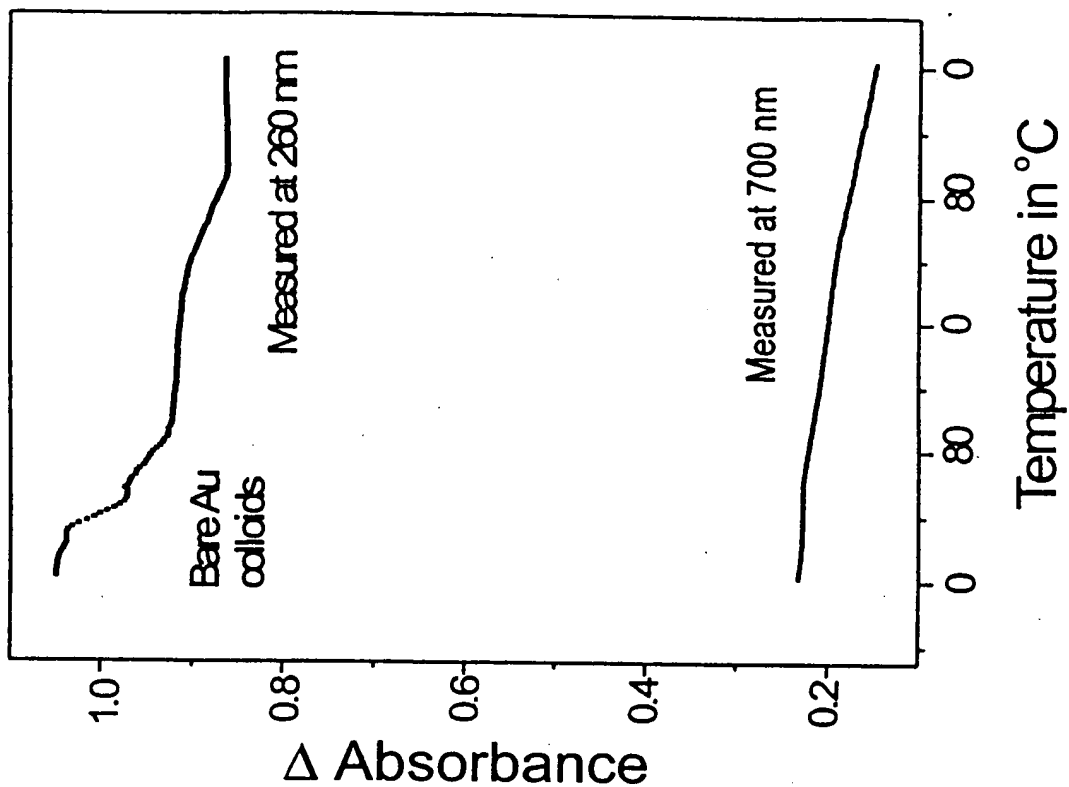


FIG. 8A

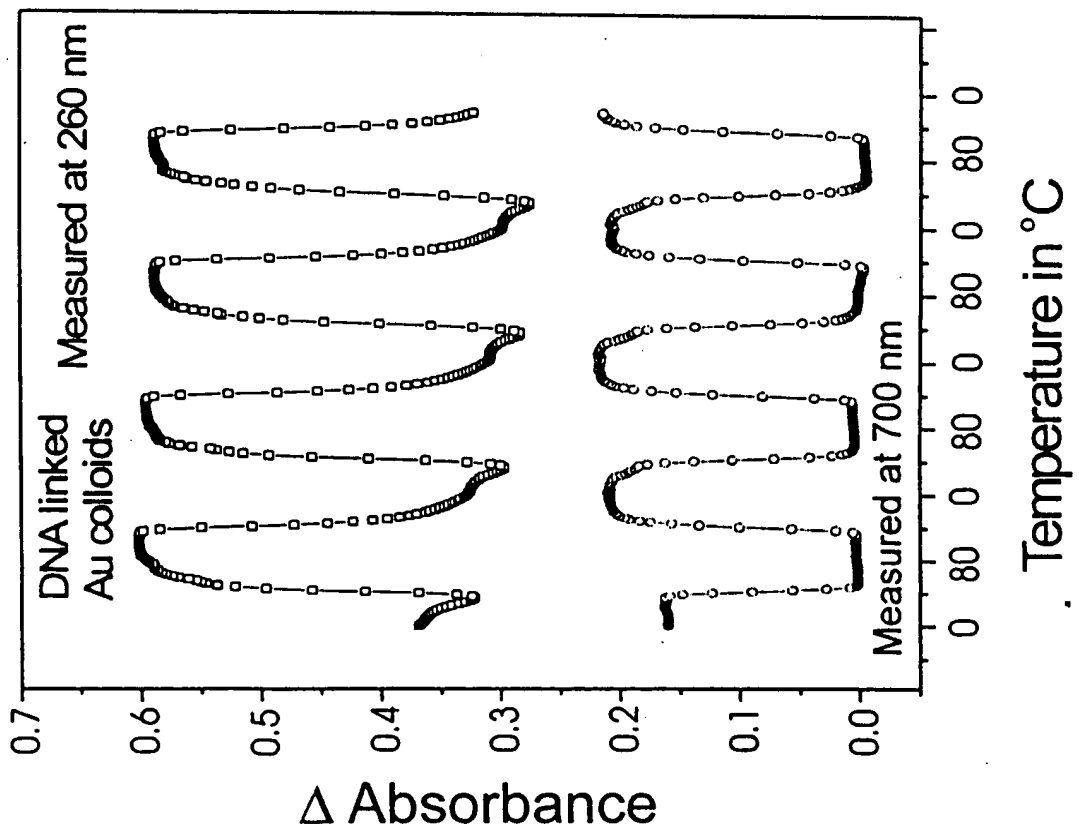




FIG. 9A

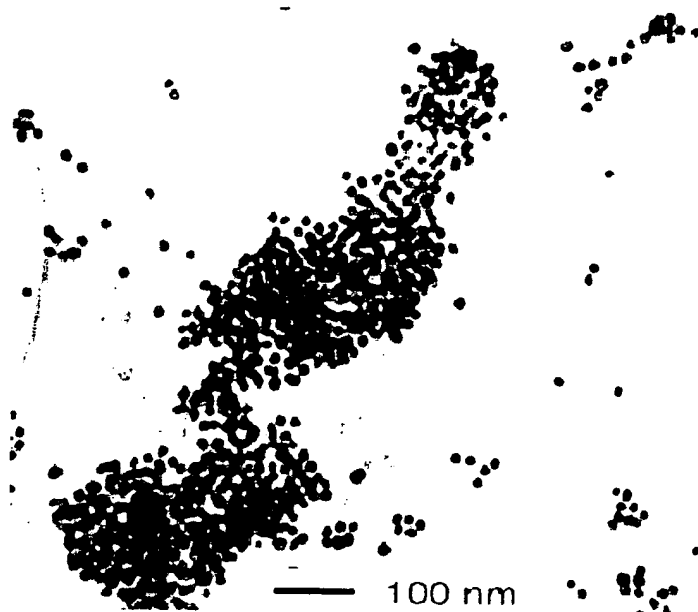


FIG. 9B

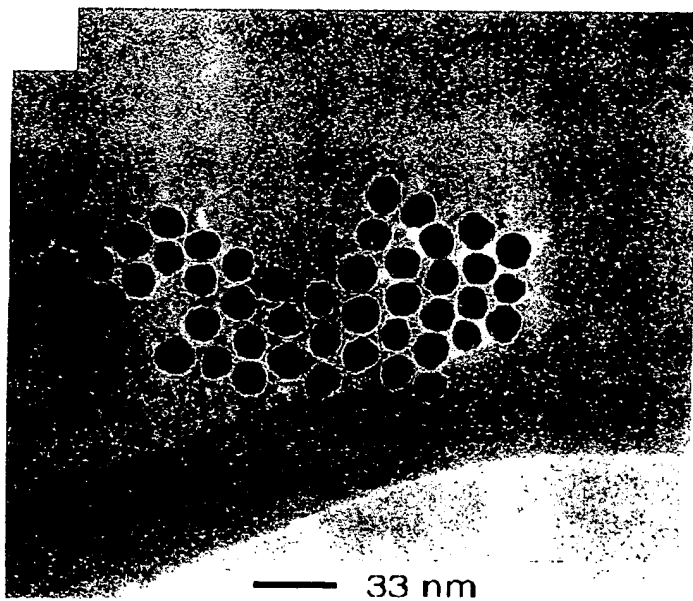


FIG. 10

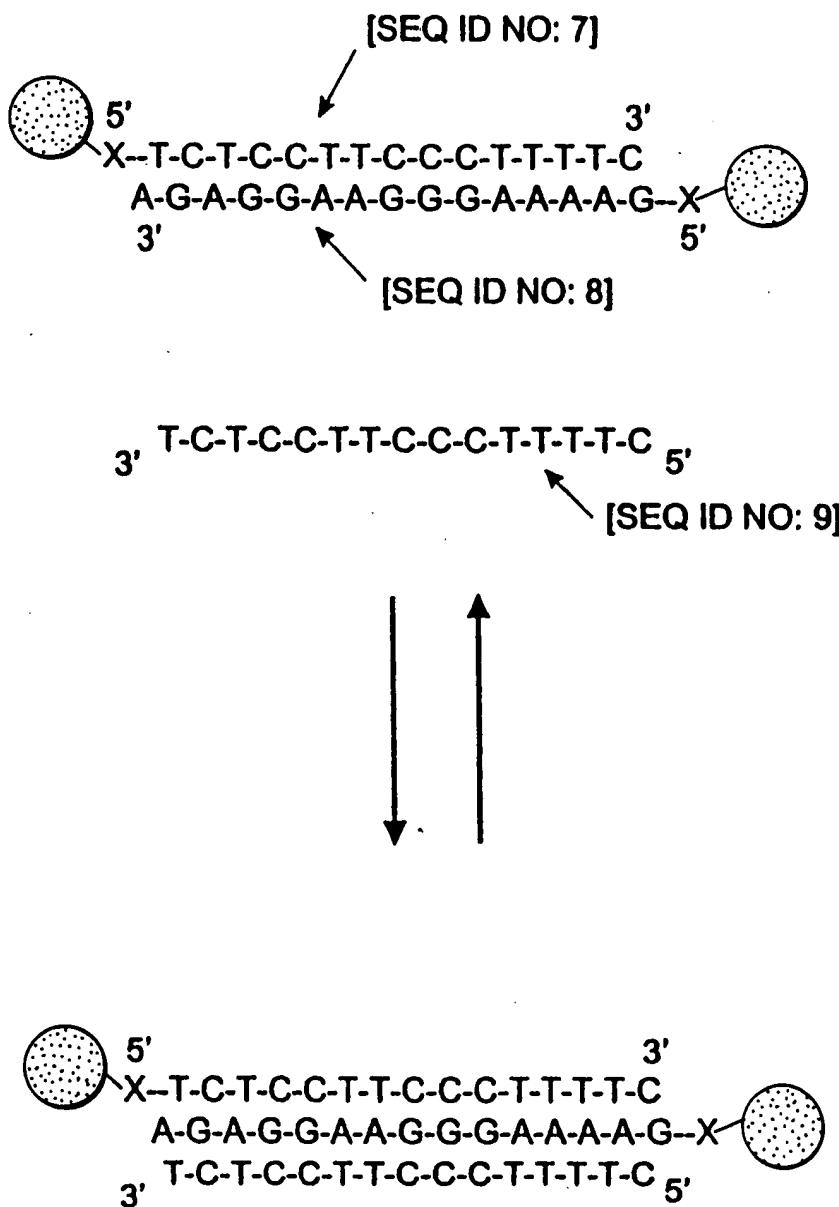
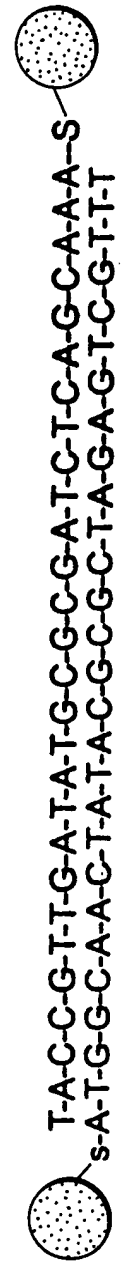
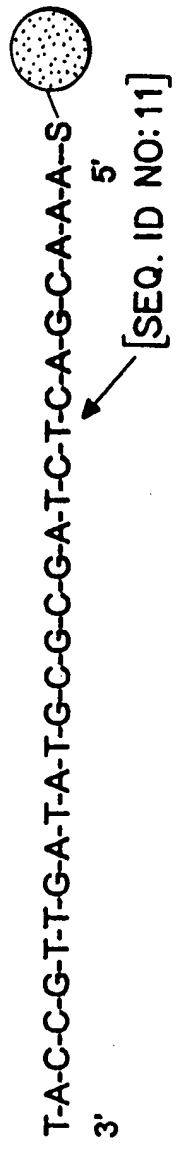
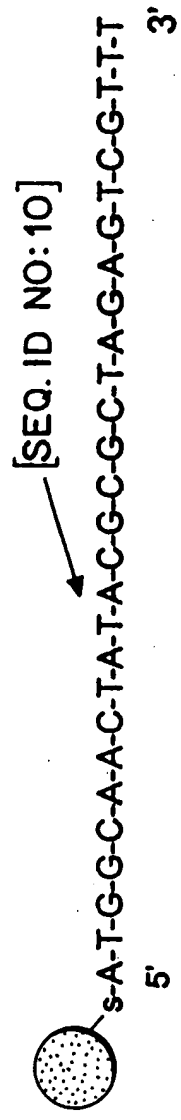


FIG. II



# FIG. 12A

12/47

## Complementary Target

[SEQ. ID NO:12]

1

[SEQ. ID NO:14]

2

3' T-C-G-T-A-C-C-A-G-C-T-A-T-C-C T-T-T-G-C-T-G-A-G-A-T-C-G-C-G  
5' A-G-C-A-T-G-G-T-C-G-A-T-A-G-G-A-A-A-C-G-A-C-T-C-T-A-G-C-G-C

3

[SEQ. ID NO:13]

# FIG. 12B

## Probes without Target

1

2

3' T-C-G-T-A-C-C-A-G-C-T-A-T-C-C T-T-T-G-C-T-G-A-G-A-T-C-G-C-G

# FIG. 12C

## Half Complementary Target

1

2

3' T-C-G-T-A-C-C-A-G-C-T-A-T-C-C T-T-T-G-C-T-G-A-G-A-T-C-G-C-G  
5' A-G-C-A-T-G-G-T-C-G-A-T-A-G-G-A-T-G-G-C-A-A-C-T-A-T-A-C-G-C

4

[SEQ. ID NO:15]

# FIG. 12D

## Target - 6 bp

1

2

3' T-C-G-T-A-C-C-A-G-C-T-A-T-C-C T-T-T-G-C-T-G-A-G-A-T-C-G-C-G  
5' G-T-C-G-A-T-A-G-G-A-A-A-C-G-A-C-T-C-T-A-G-C-G-C

5

[SEQ. ID NO:16]

# FIG. 12E

## One bp Mismatch

1

2

3' T-C-G-T-A-C-C-A-G-C-T-A-T-C-C T-T-T-G-C-T-G-A-G-A-T-C-G-C-G  
5' A-G-C-A-T-G-G-T-T-G-A-T-A-G-G-A-A-A-C-G-A-C-T-C-T-A-G-C-G-C

6

[SEQ. ID NO:17]

# FIG. 12F

## Two bp Mismatch

1

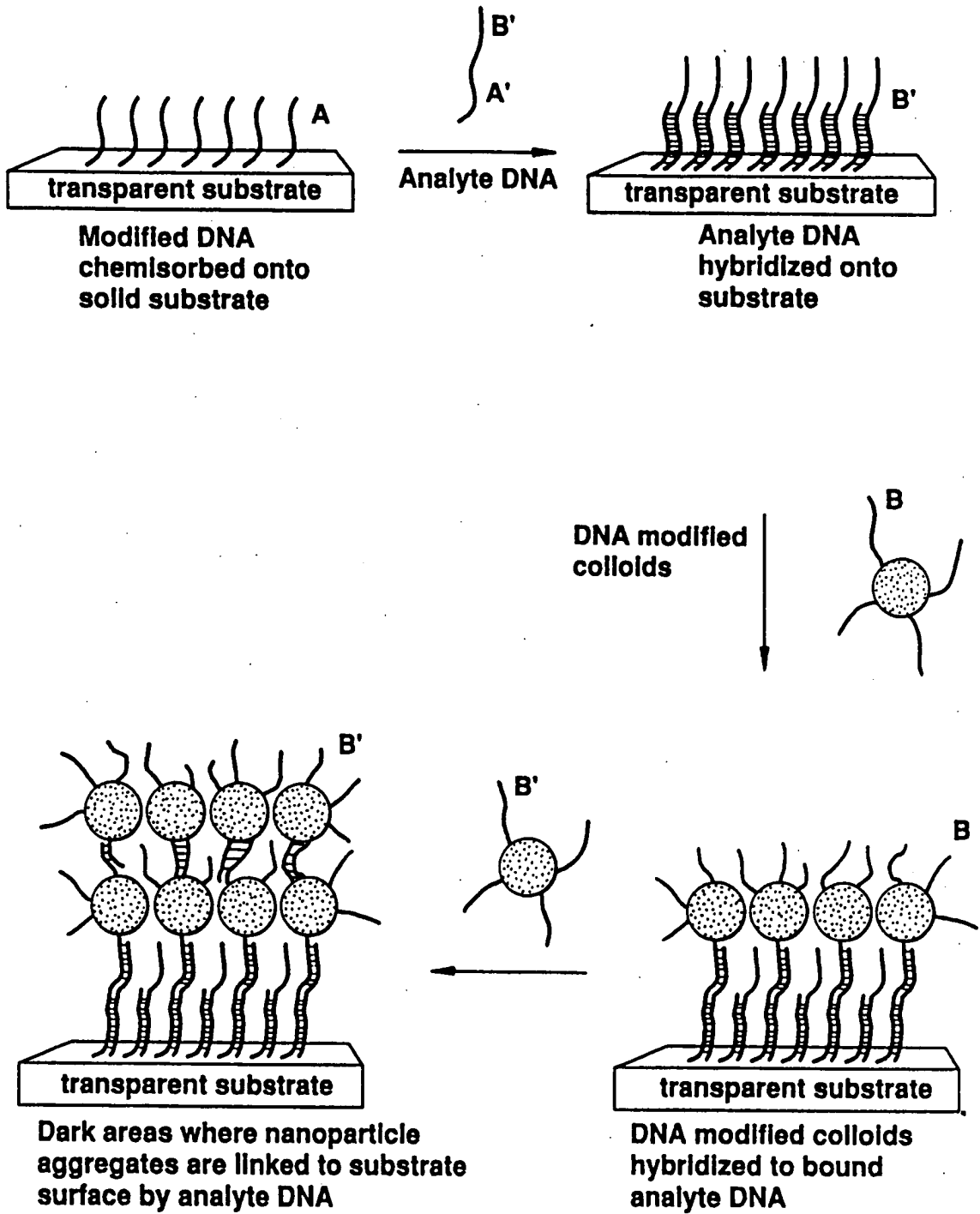
2

3' T-C-G-T-A-C-C-A-G-C-T-A-T-C-C T-T-T-G-C-T-G-A-G-A-T-C-G-C-G  
5' A-G-C-A-T-G-T-T-G-A-T-A-G-G-A-A-A-C-G-A-C-T-C-T-A-G-C-G-C

7

[SEQ. ID NO:18]

# FIG. 13A



# FIG. 13B

14/47

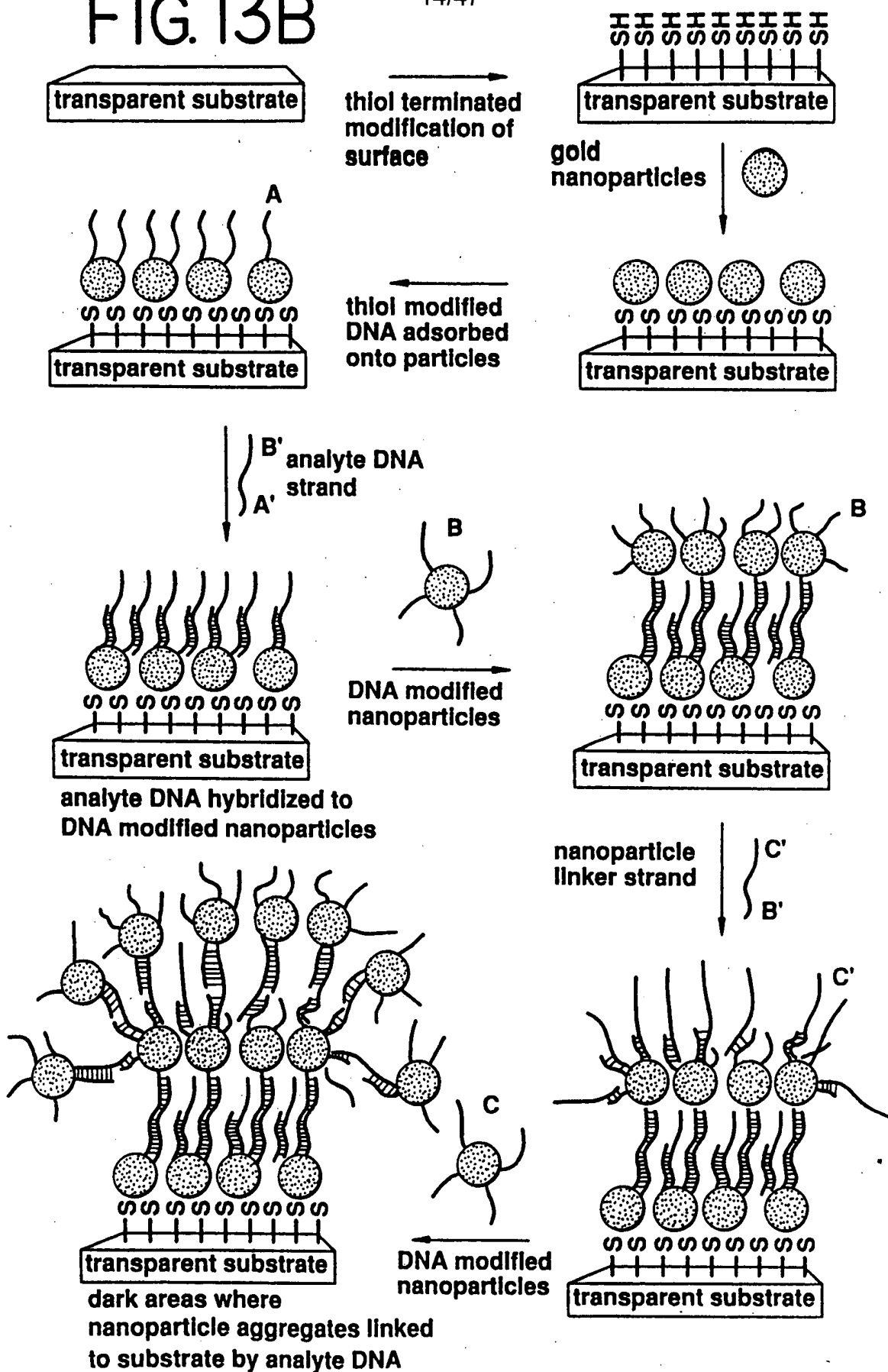


FIG. 14A

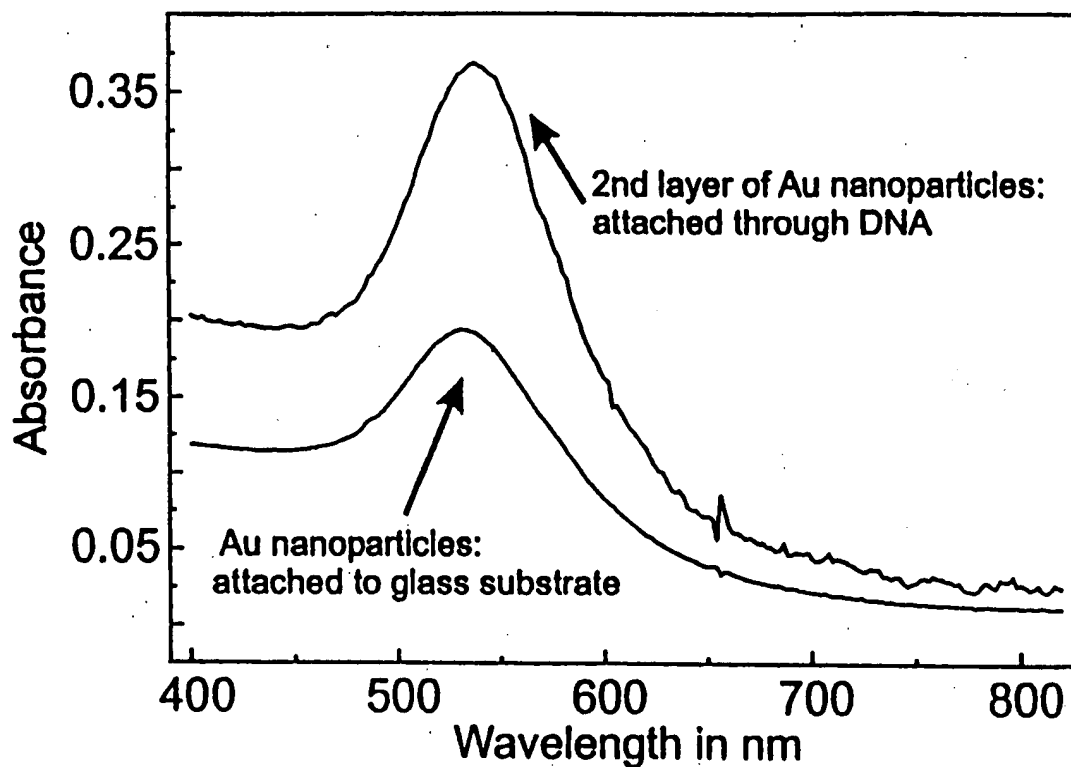


FIG. 14B

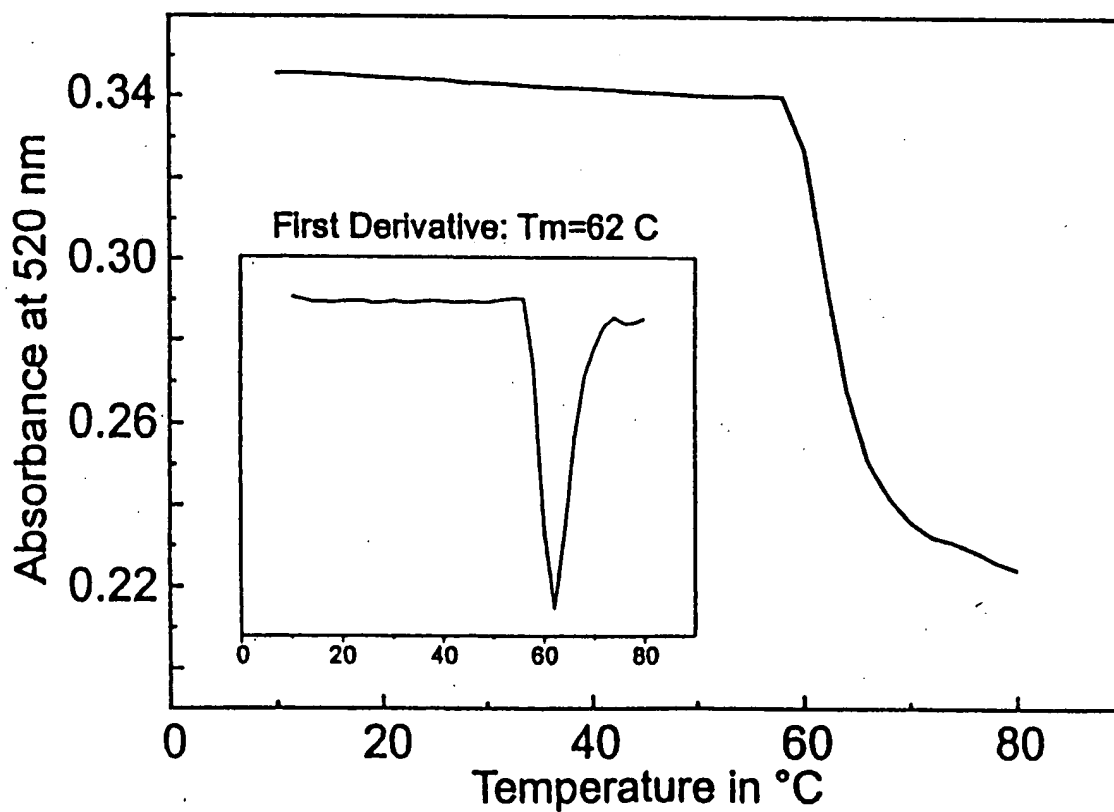


FIG. 15A

Probes with No Target

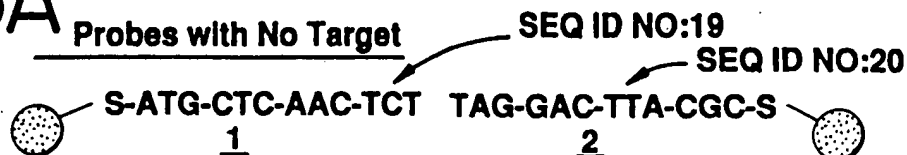


FIG. 15B

Half-Complementary Target

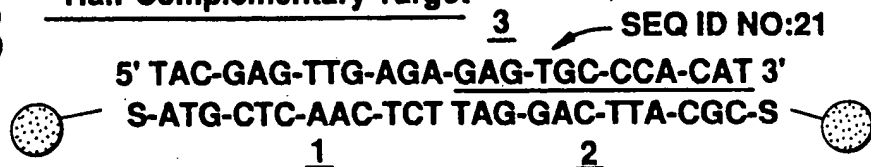


FIG. 15C

Complementary Target

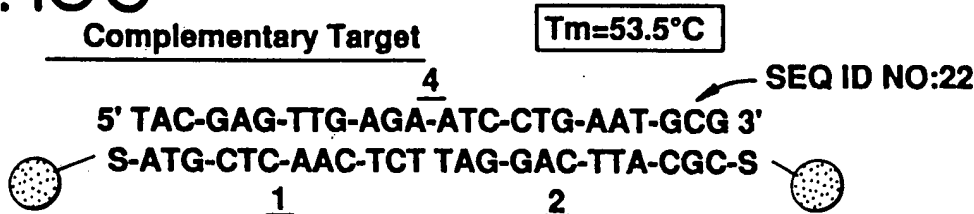


FIG. 15D

ONE Base-Pair Mismatch at Probe Head

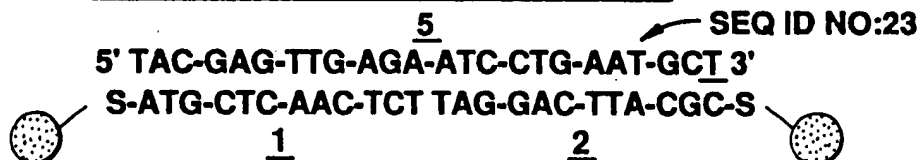


FIG. 15E

ONE Base-Pair Mismatch at Probe Tail

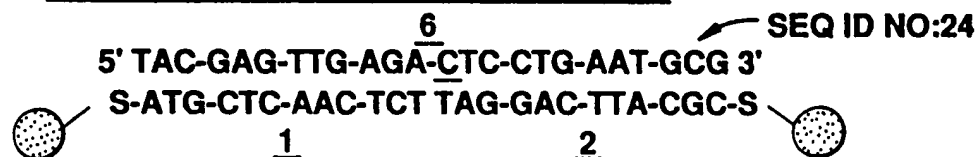


FIG. 15F

ONE Base Deletion

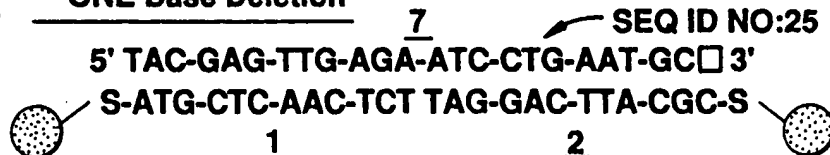
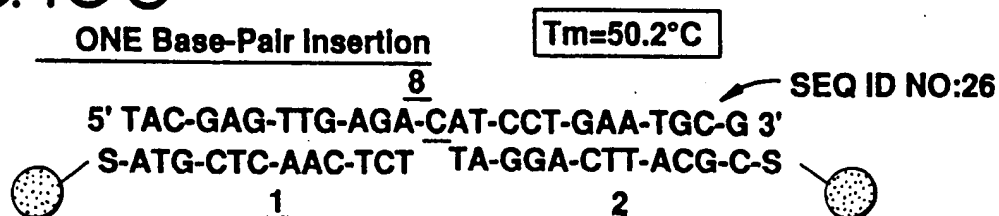


FIG. 15G

ONE Base-Pair Insertion





24 Base Template

FIG. 16A

5' TAC-GAG-TTG-AGA-ATC-CTG-AAT-GCG 3'  
—S-ATG-CTC-AAC-TCT TAG-GAC-TTA-CGC-S —  
1 2

FIG. 16B

48 Base Template with Complementary 24 Base Filler

5' TAC-GAG-TTG-AGA-CCG-TTA-AGA-CGA-GGC-AAT-CAT-GCA-ATC-CTG-AAT-GCG 3'  
—S-ATG-CTC-AAC-TCT GGC-AAT-TCT-GCT-CCG-TTA-GTA-CGT TAG-GAC-TTA-CGC-S —  
1 2

FIG. 16C

72 Base Template with Complementary 48 Base Filler

5' TAC-GAG-TTG-AGA-CCG-TTA-AGA-CGA-GGC-AAT-CAT-GCA-TAT-ATT-GGA-CGC-TTT-ACG-GAC-AAC-ATC-CTG-AAT-GCG 3'  
—S-ATG-CTC-AAC-TCT GGC-AAT-TCT-GCT-CCG-TTA-GTA-CGT-ATA-TAA-CCT-GCG-AAA-TGC-CTG-TTG TAG-GAC-TTA-CGC-S —  
1 2

FIG. 17B

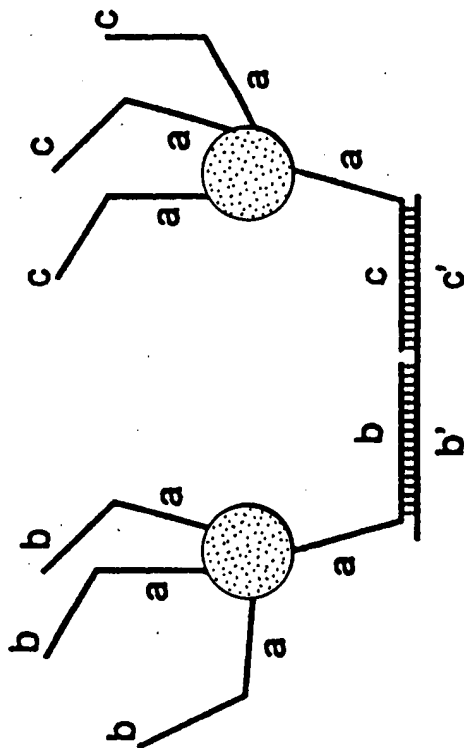


FIG. 17A

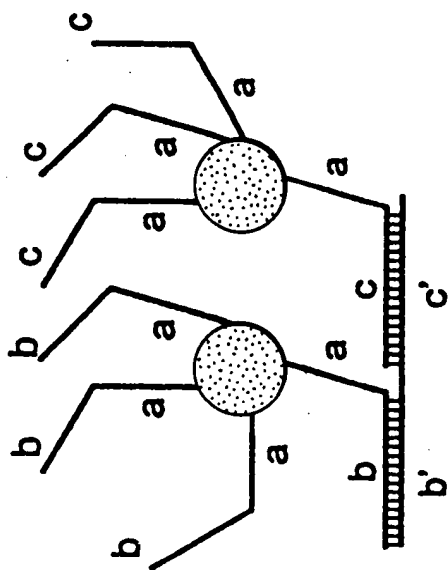


FIG. 17C

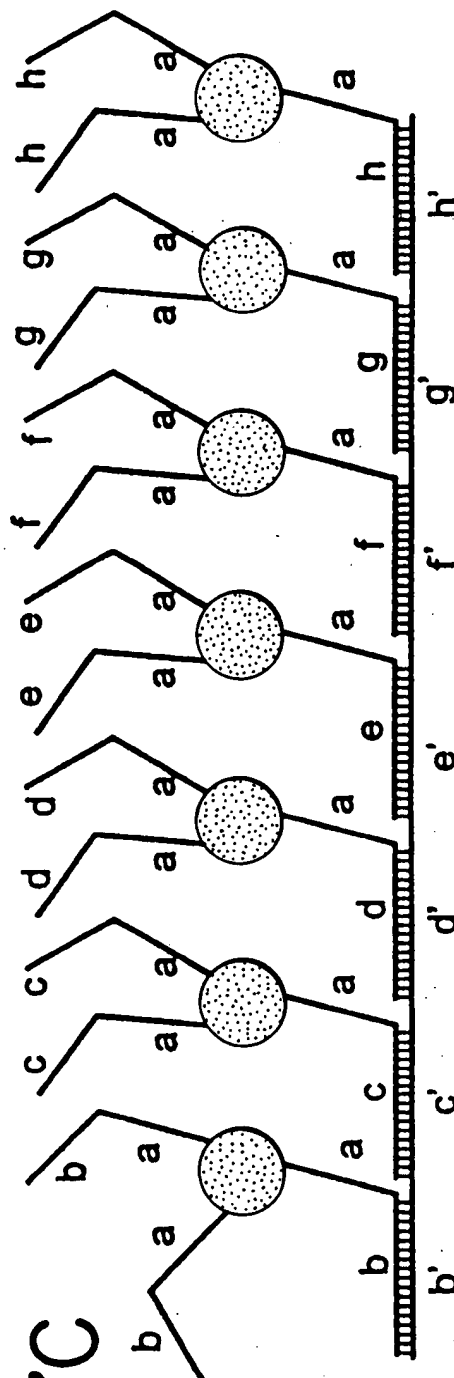


FIG. 17D

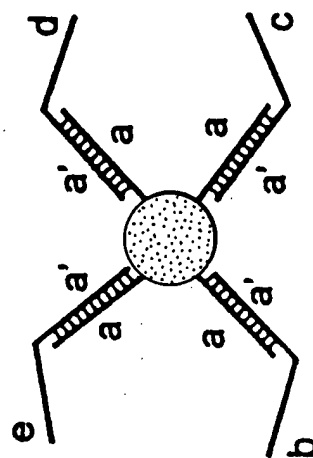
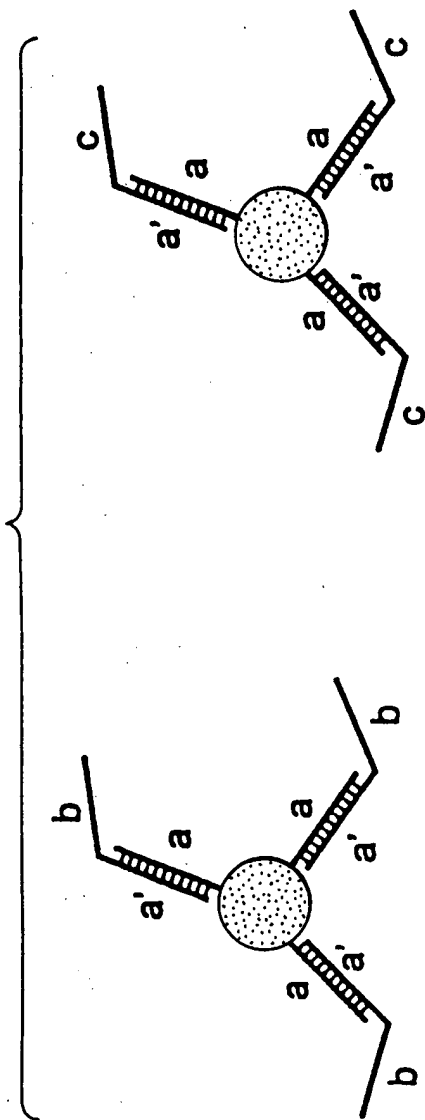


FIG. 17E

FIG. 18

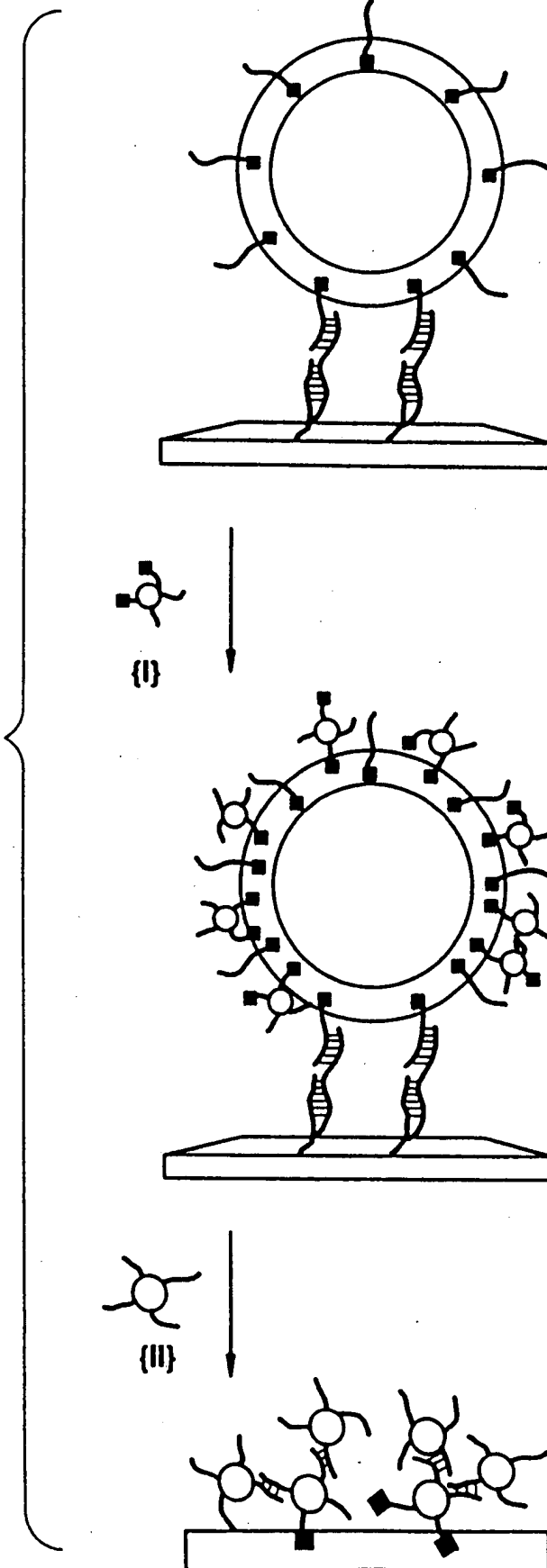


FIG. 19A

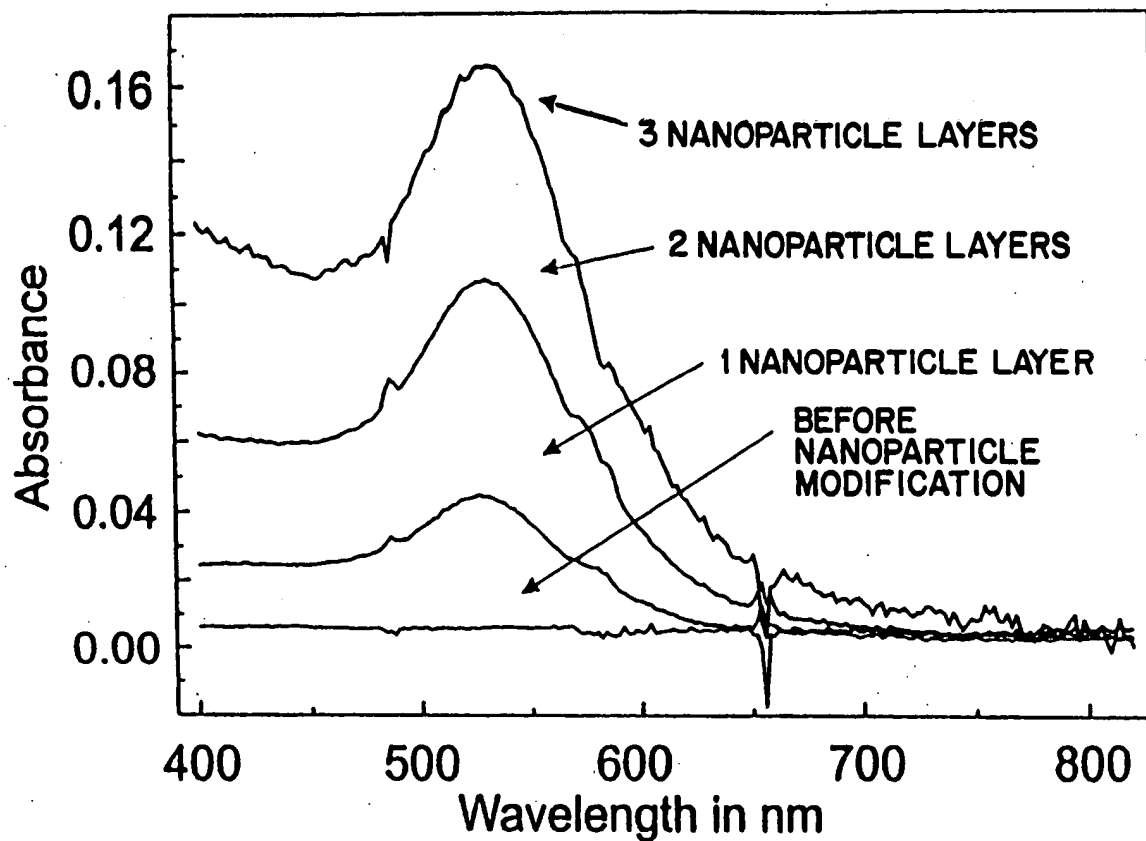


FIG. 19B

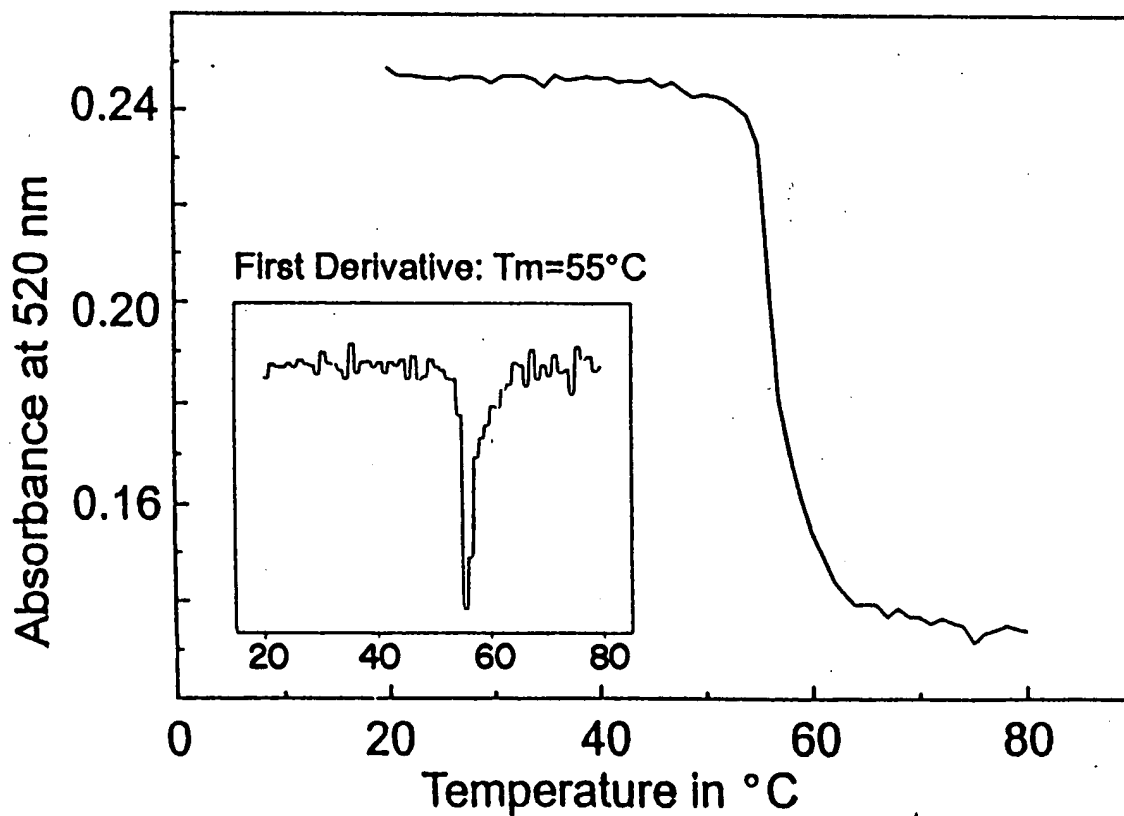


FIG. 20A

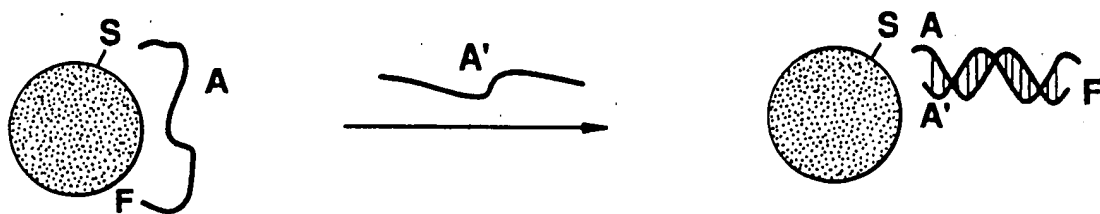
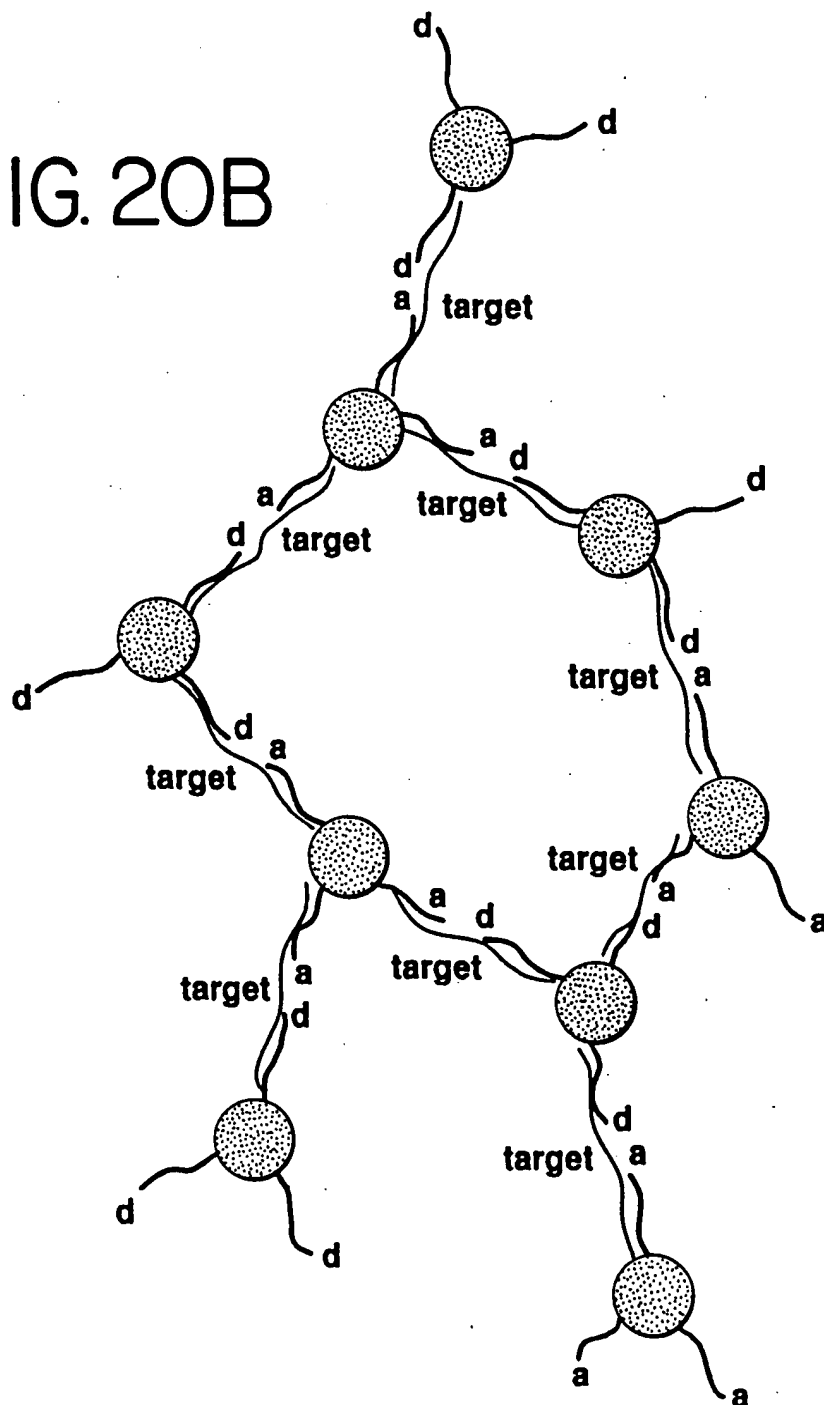


FIG. 20B



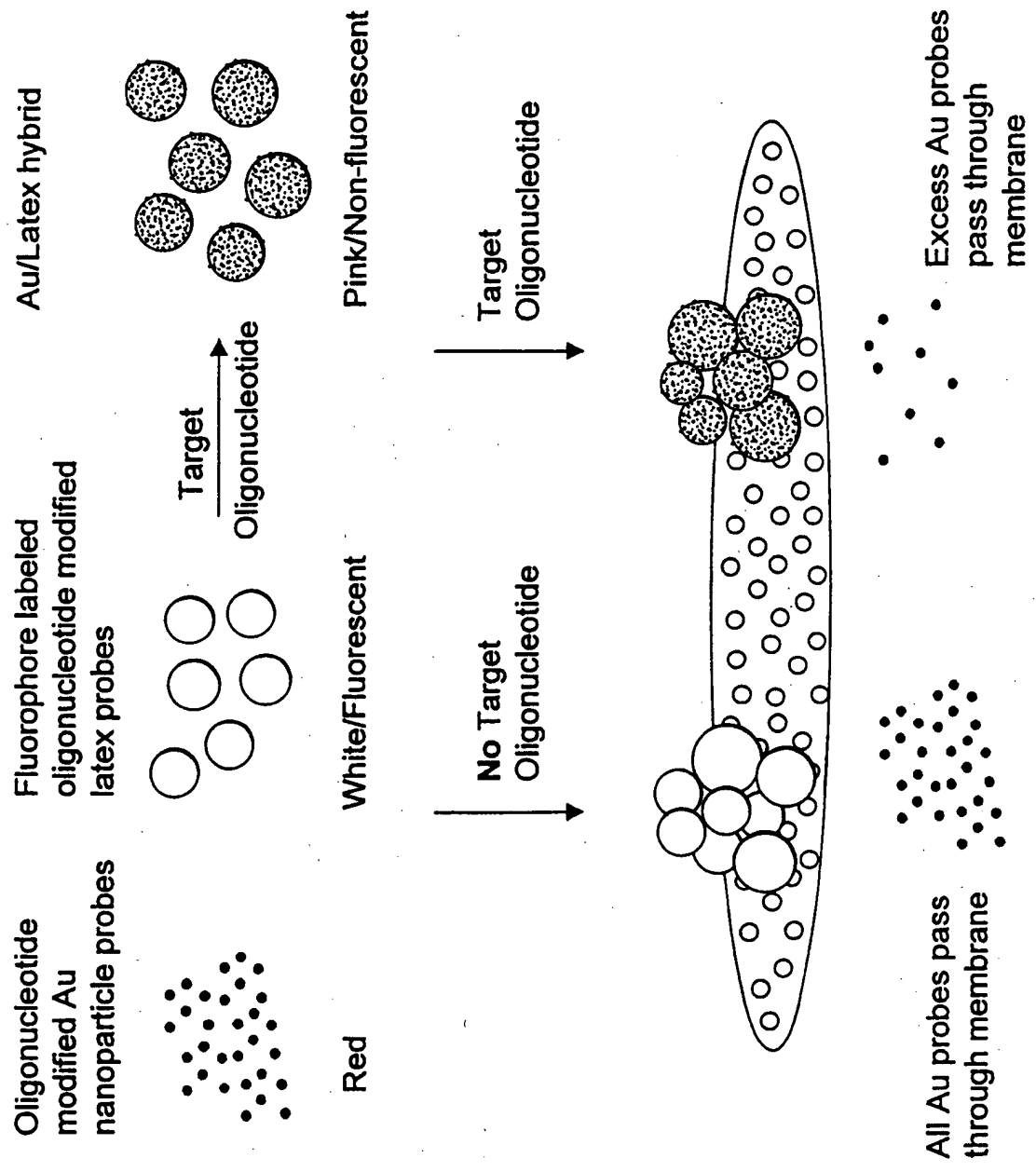
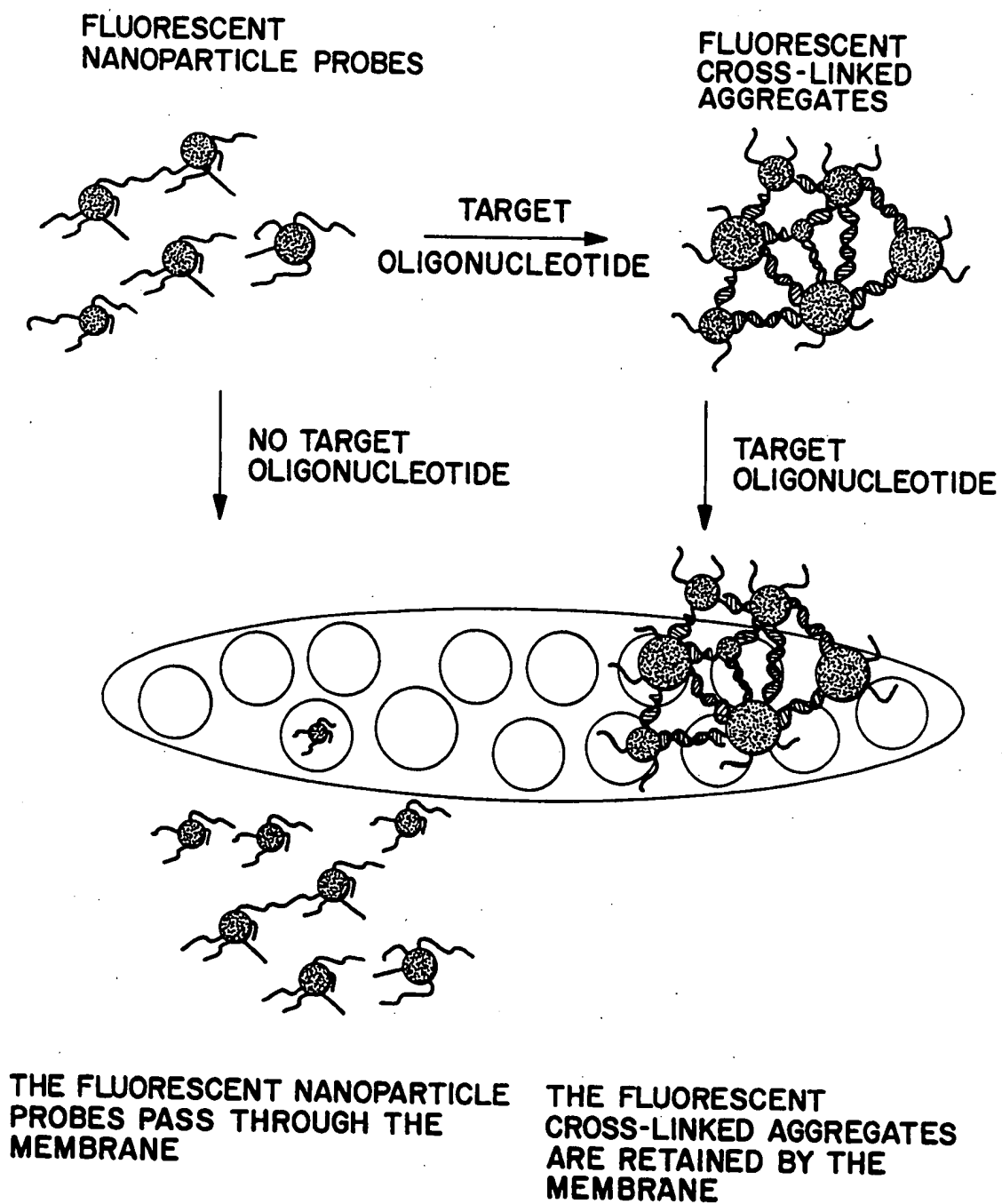


FIG. 21

FIG. 22





# FIG. 23

## Anthrax PCR Product

5'G GCG GAT GAG TCA GTA GTT AAG GAG GCT CAT AGA GAA GTA ATT AAT  
3'C CGC CTA CTC AGT CAT CAA TTC CTC CGA GTA TCT CTT CAT TAA TTA

TCG TCA ACA GAG GGA TTA TTG TTA AAT ATT GAT AAG GAT ATA AGA AAA  
AGC AGT TGT CTC CCT AAT AAC AAT TTA TAA CTA TTC CTA TAT TCT TTT

ATA TTA TCC AGG GTT ATA TTG TAG AAA TTG AAG ATA CTG AAG GGC TT 3'  
TAT AAT AGG TCC CAA TAT AAC ATC TTT AAC TTC TAT GAC TTC CCG AA 5'

**141 mer Anthrax PCR product** [SEQ ID NO:36]

3' CTC CCT AAT AAC AAT



[SEQ ID NO:37]

3' TTA TAA CTA TTC CTA



[SEQ ID NO:38]

Oligonucleotide-Nanoparticle Probes

## Blocker Oligonucleotides

3' C CGC CTA CTC AGT CAT CAA TTC CTC CGA GT  
3' A TCT CTT CAT TAA TTA AGC AGT TGT  
3' TAT TCT TTT TAT AAT AGG TCC CAA TAT  
3' AAC ATC TTT AAC TTC TAT GAC TTC CCG AA

[SEQ ID NO:39]

[SEQ ID NO:40]

[SEQ ID NO:41]

[SEQ ID NO:42]

FIG. 24

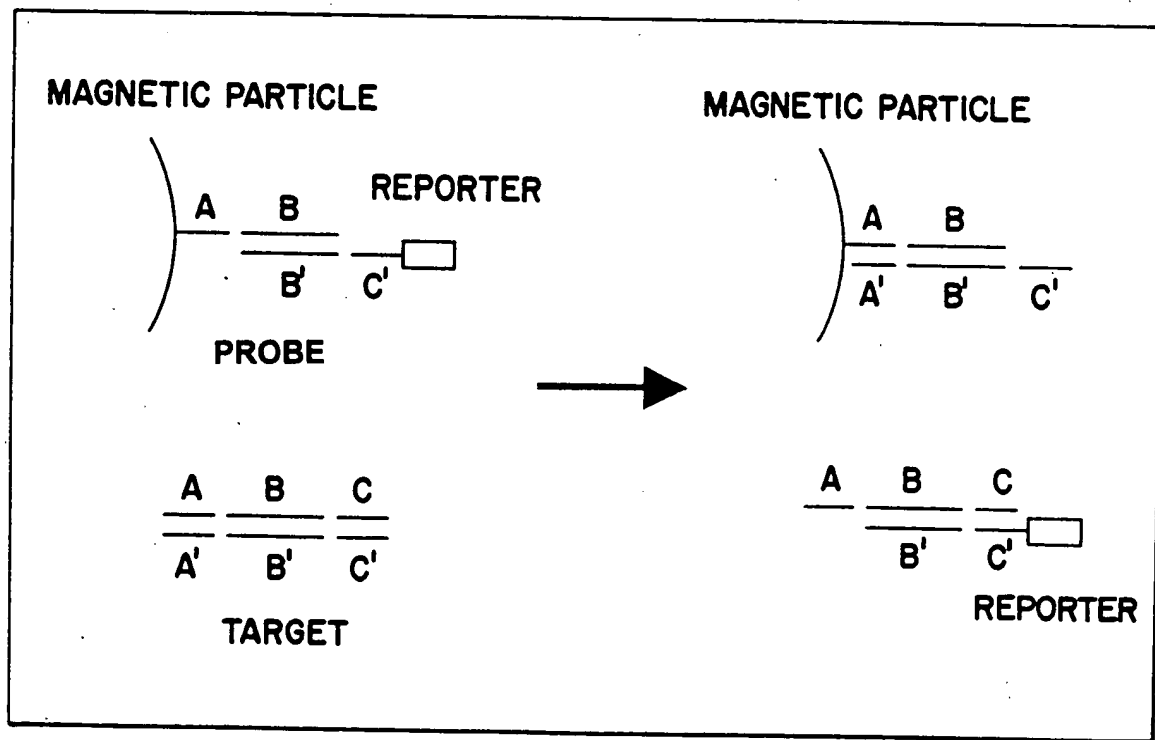
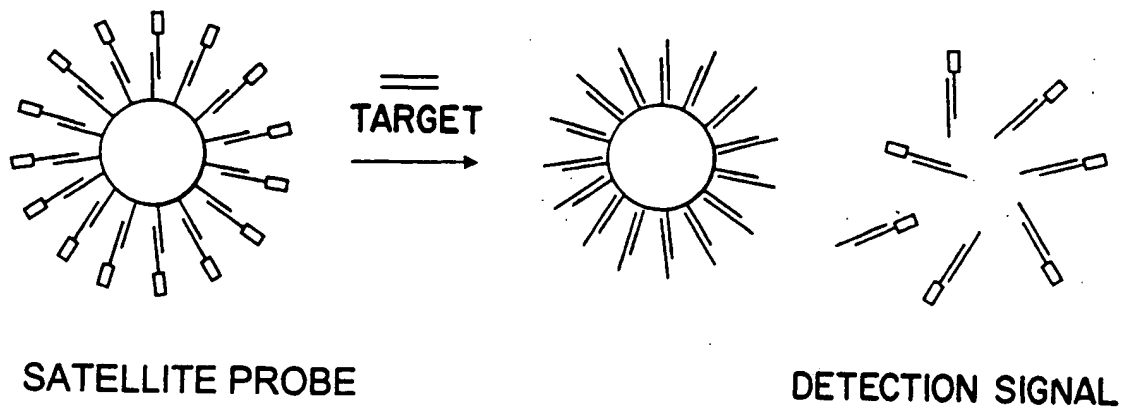


FIG. 25A

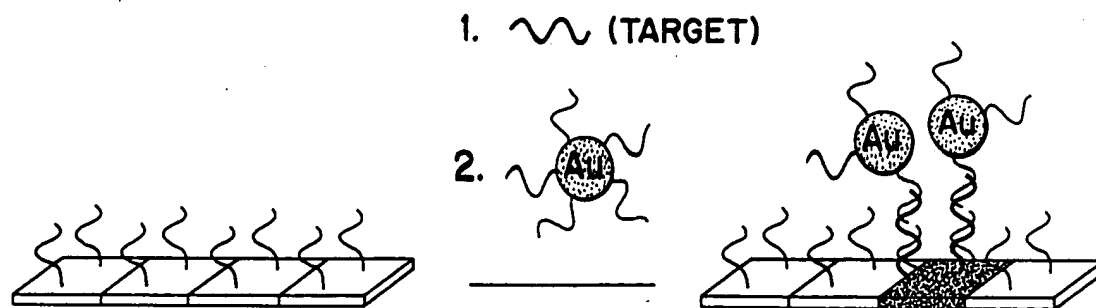


FIG. 25B

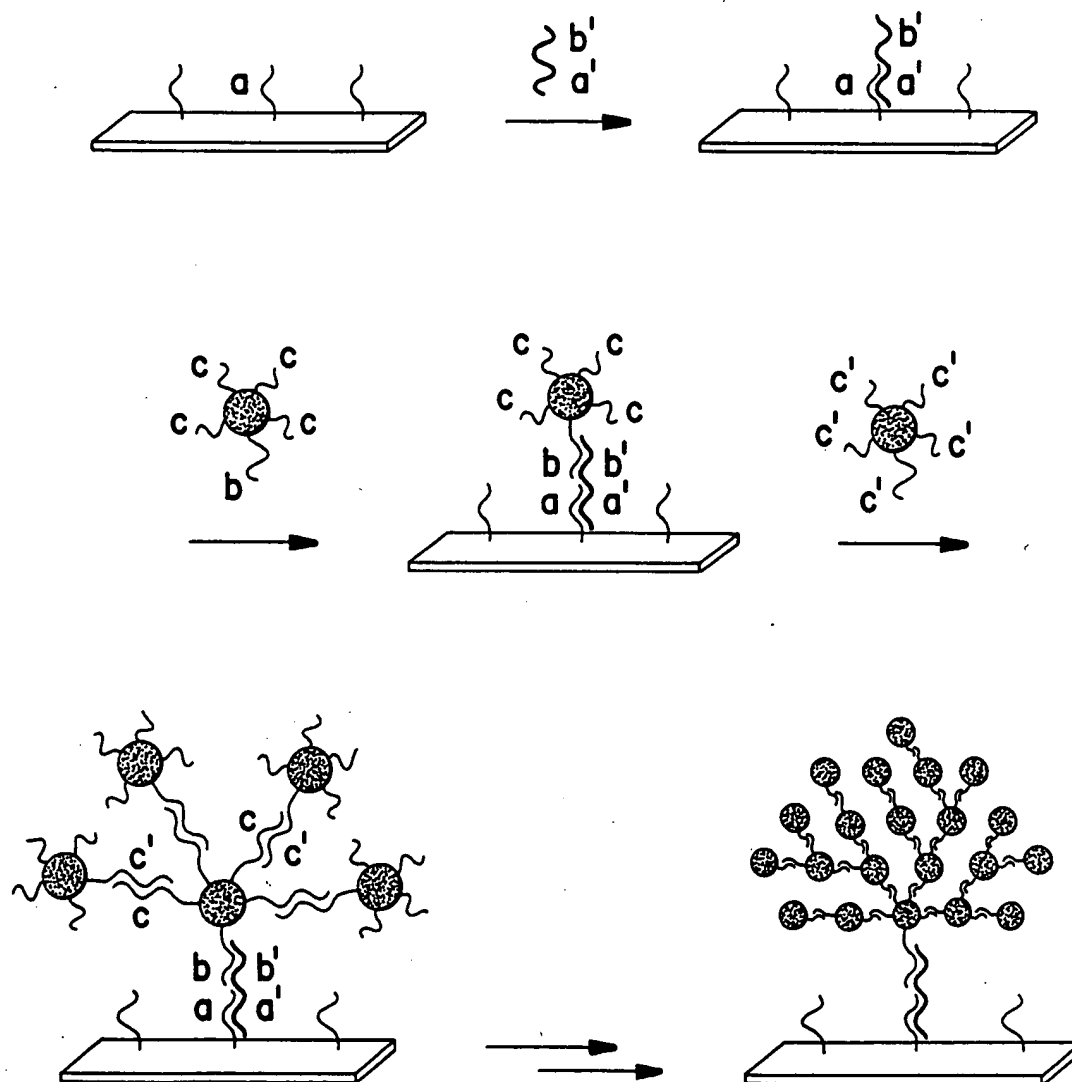


FIG. 26A

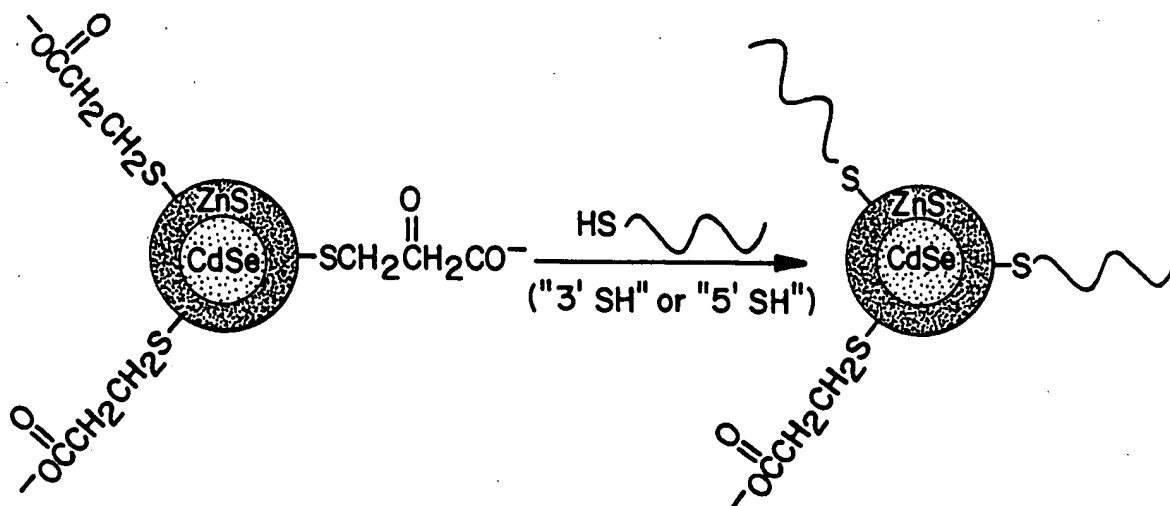
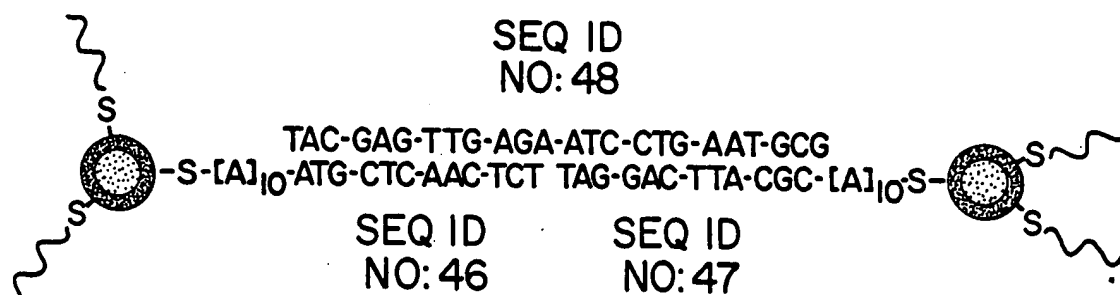
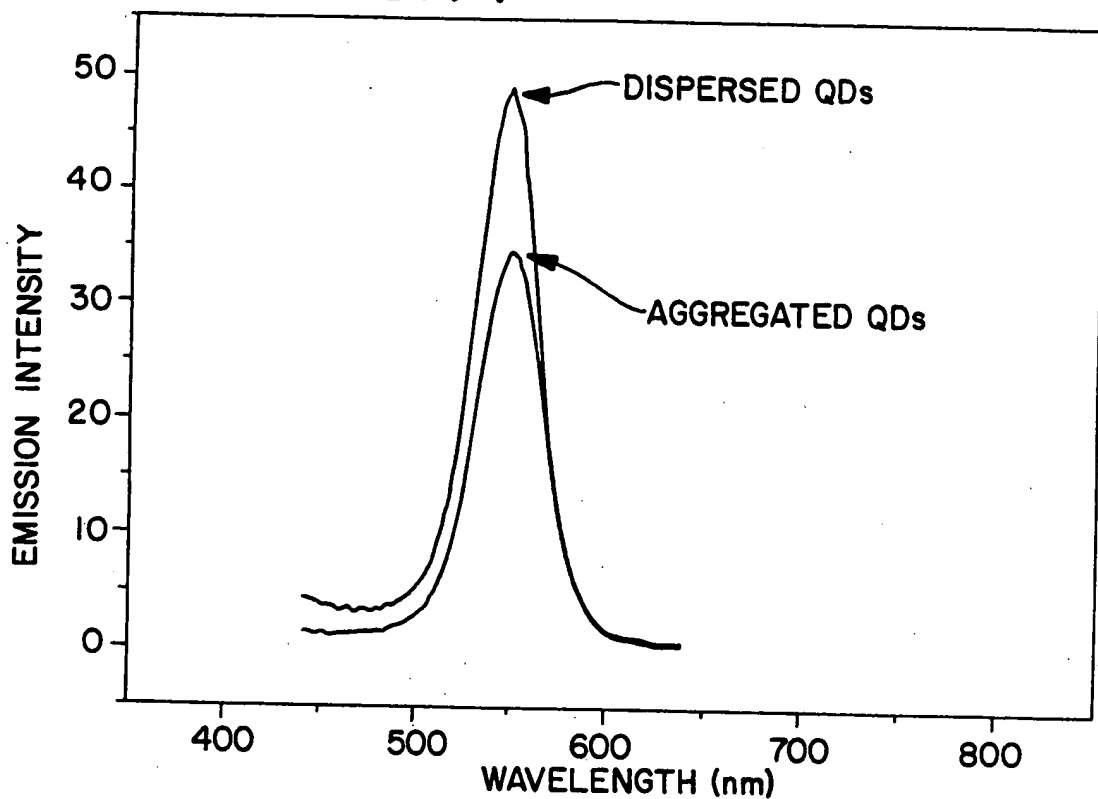


FIG. 26B



29/47

# FIG. 27A



# FIG. 27B

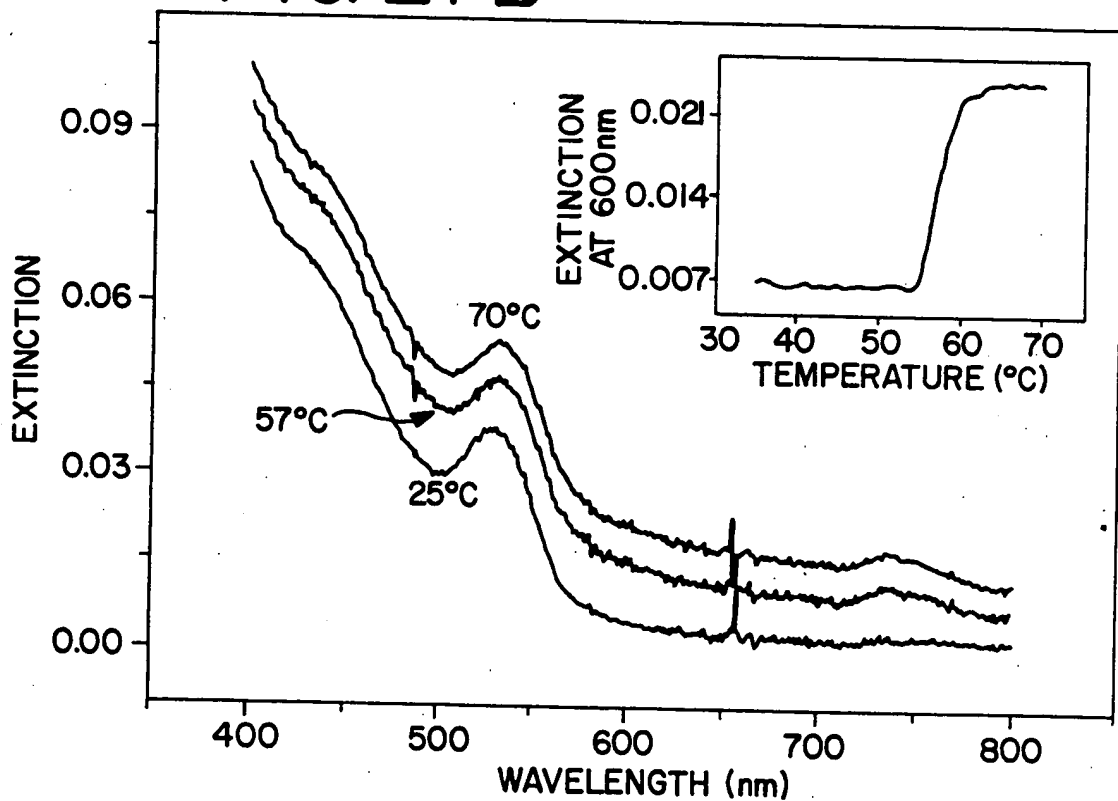


FIG. 27C

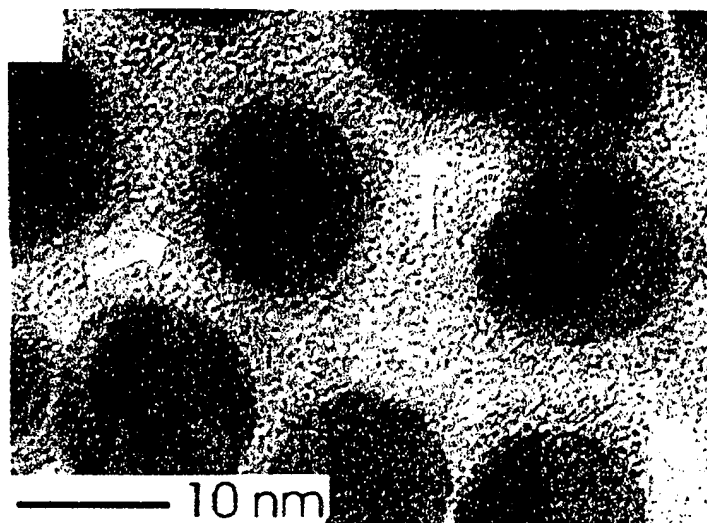


FIG. 27D

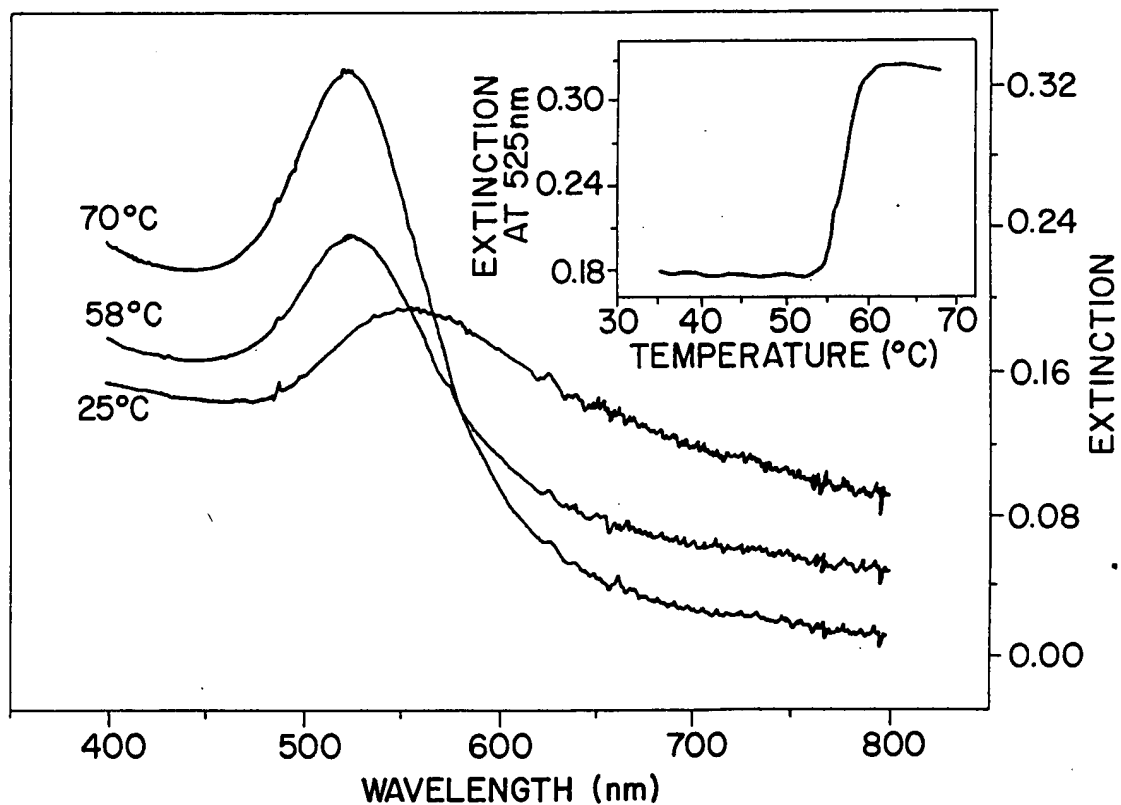


FIG. 28A

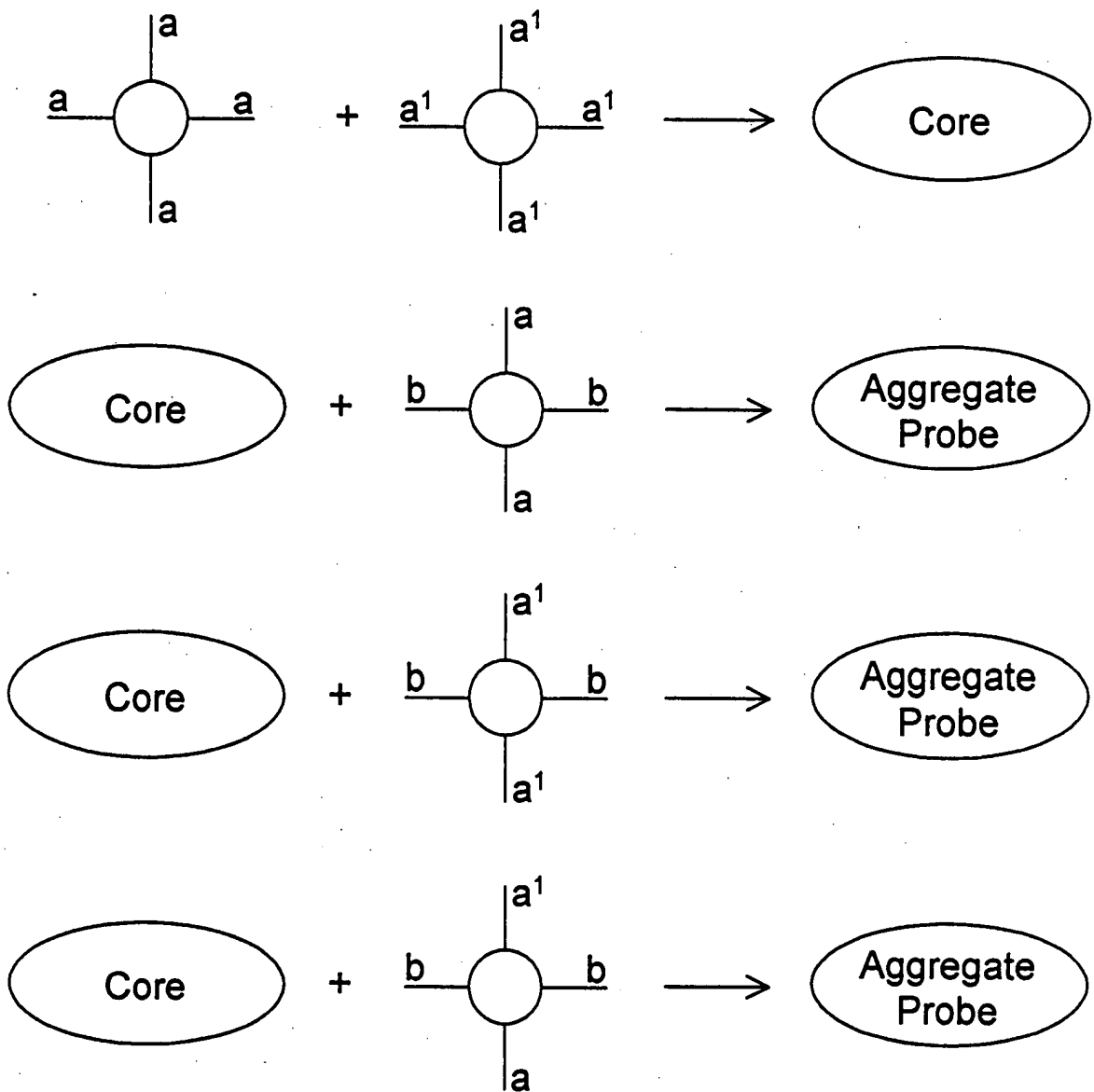


FIG. 28B

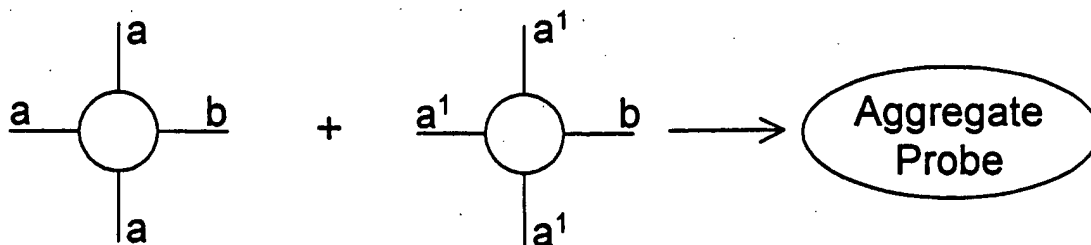


FIG. 28C

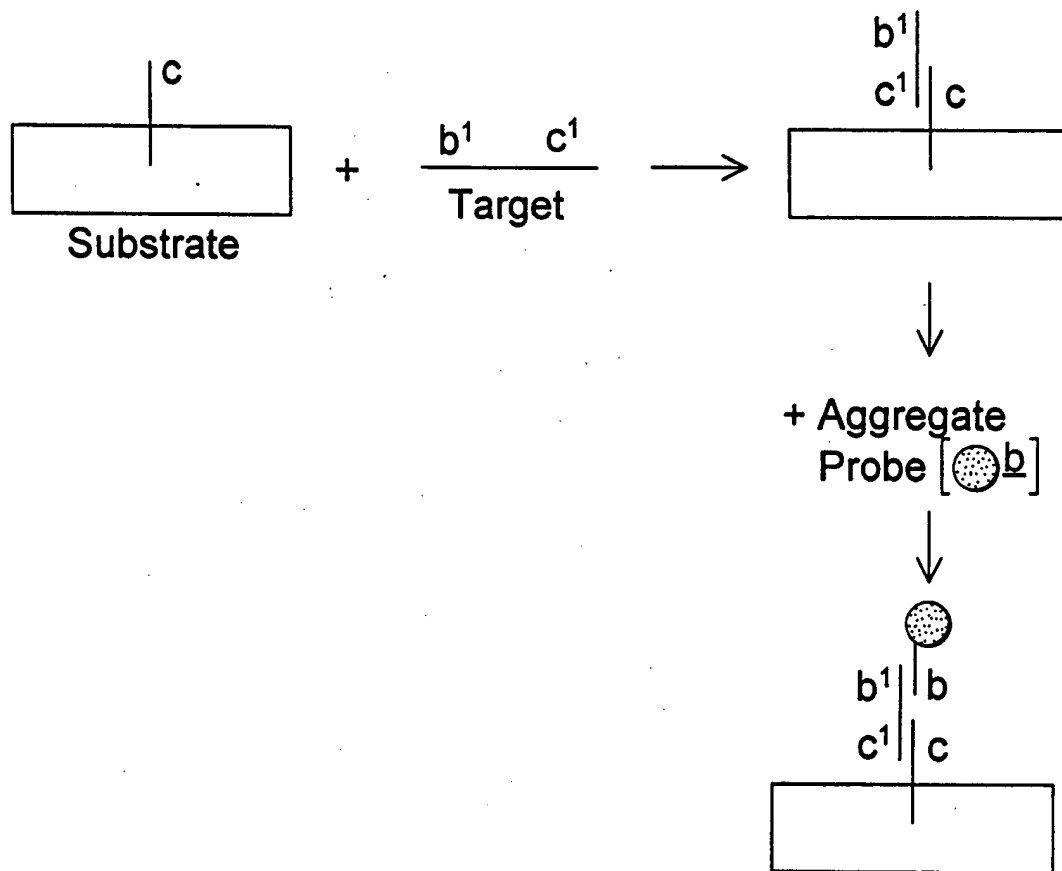




FIG. 28D

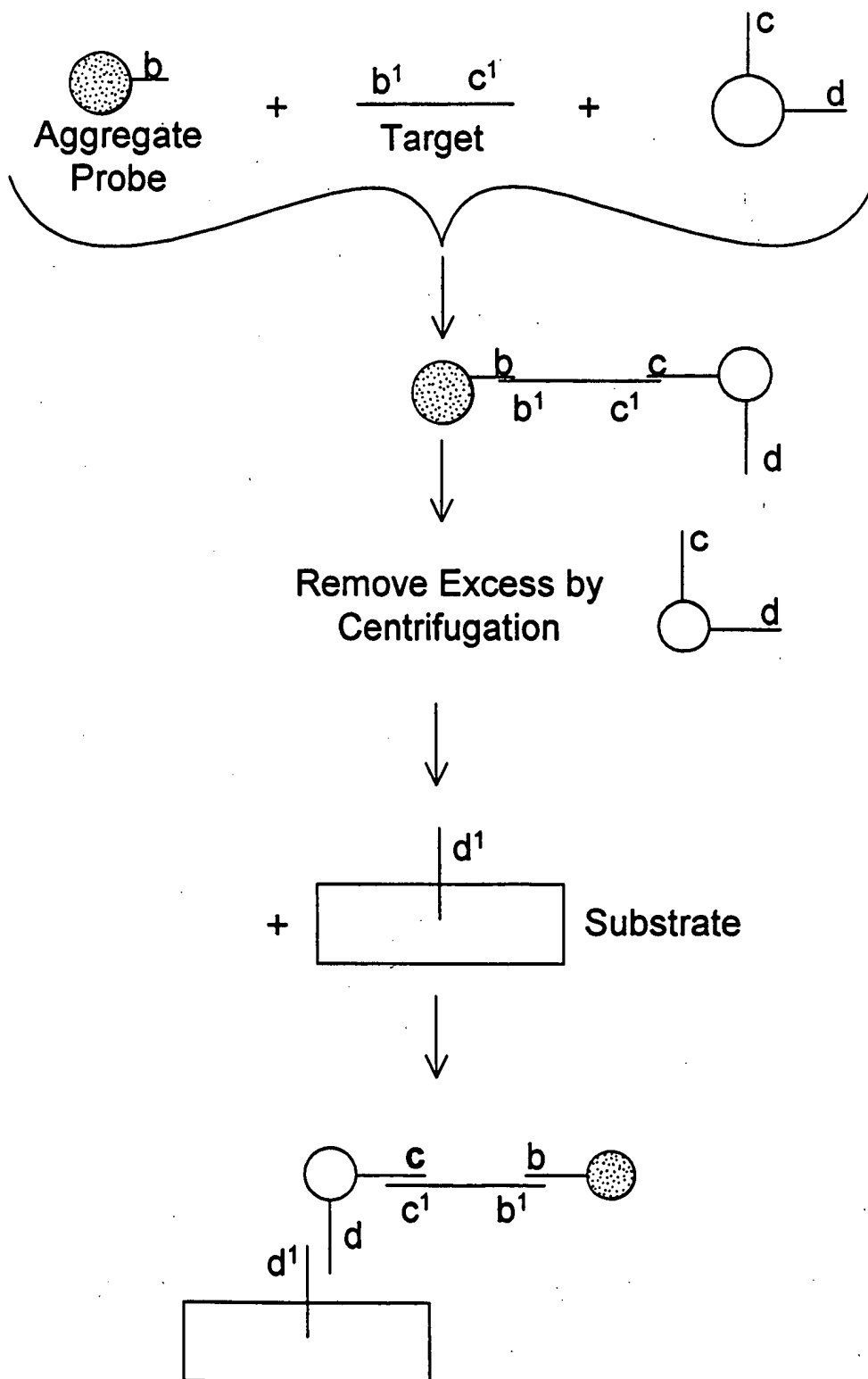
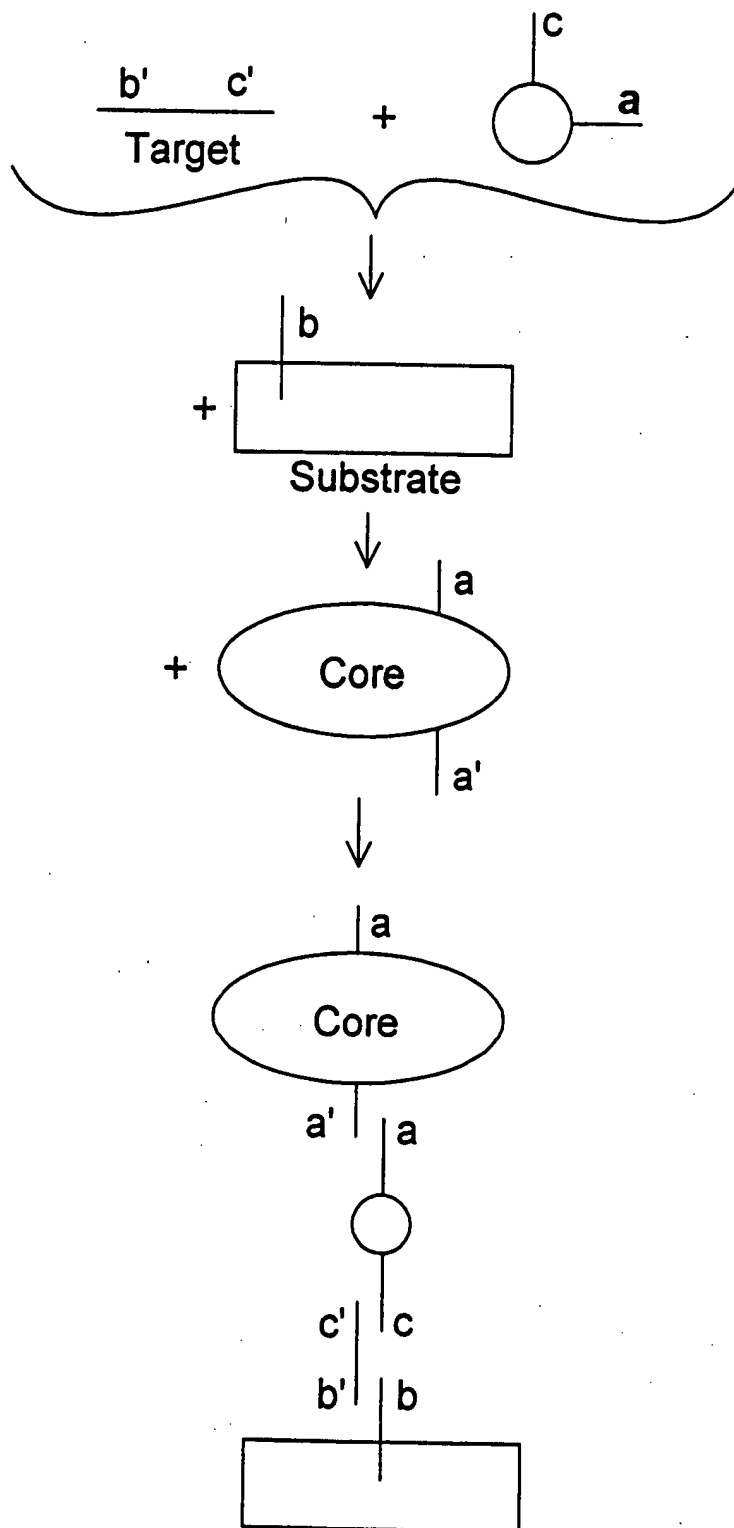


FIG. 28E



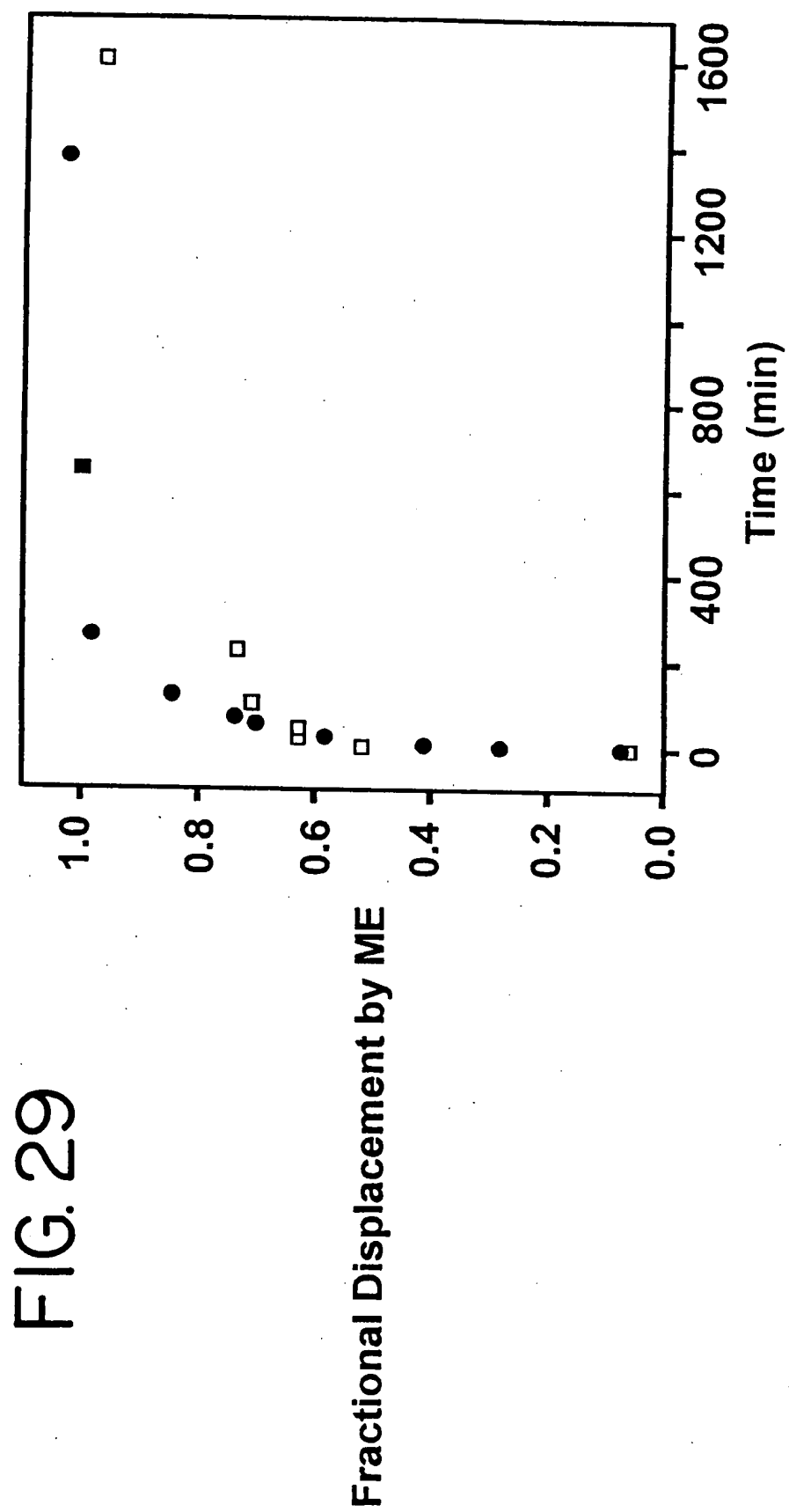


FIG. 30

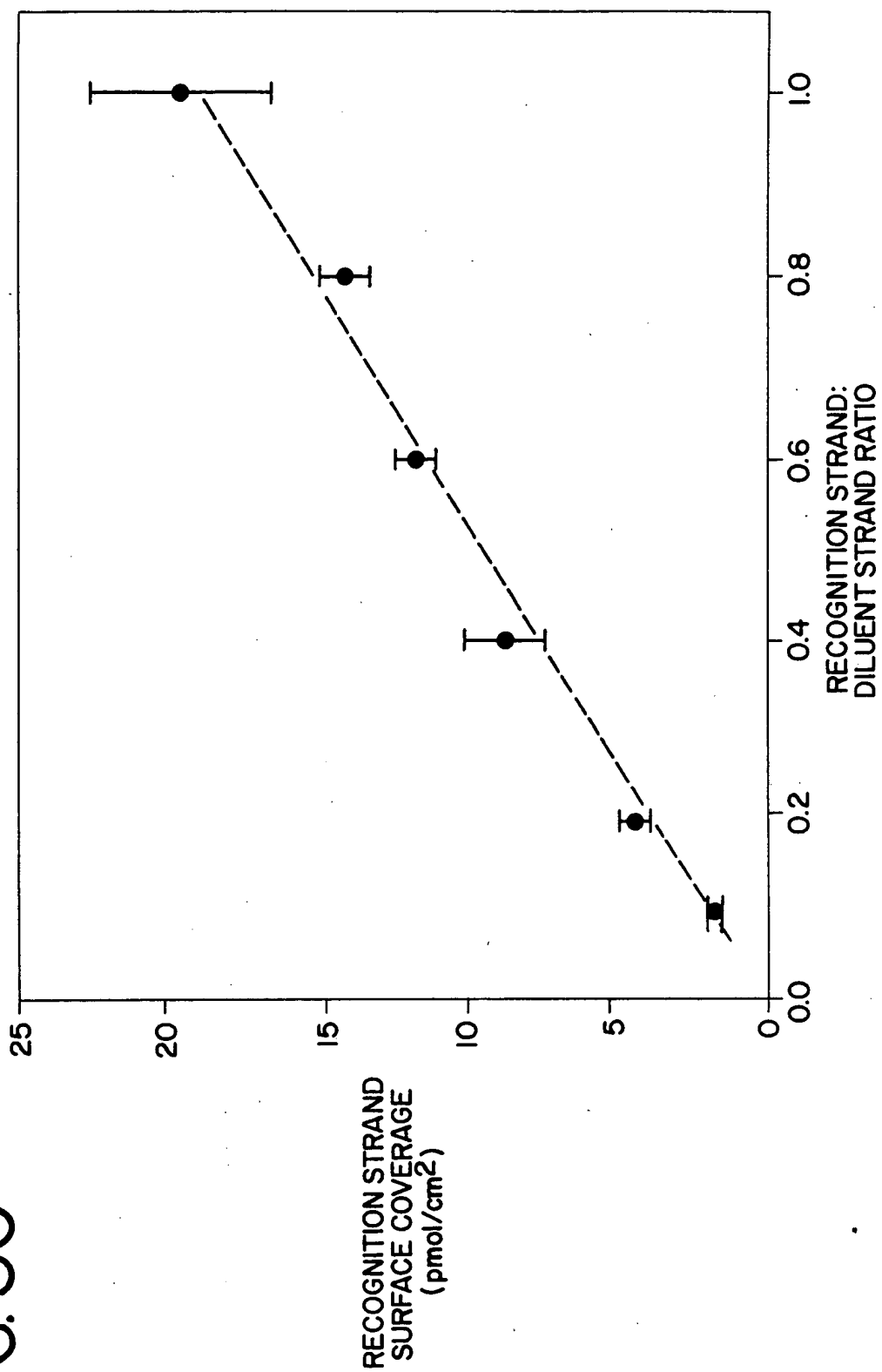
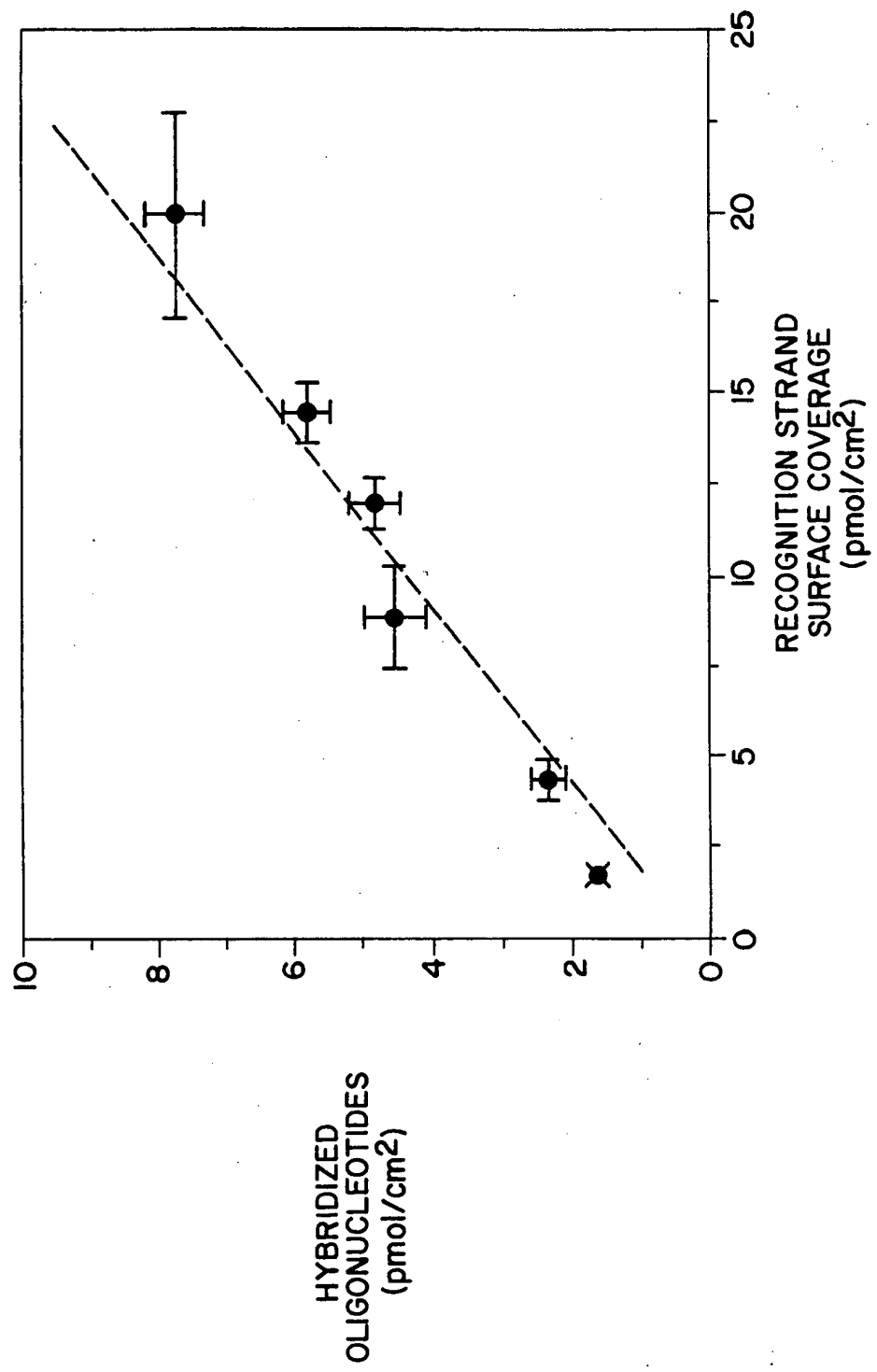
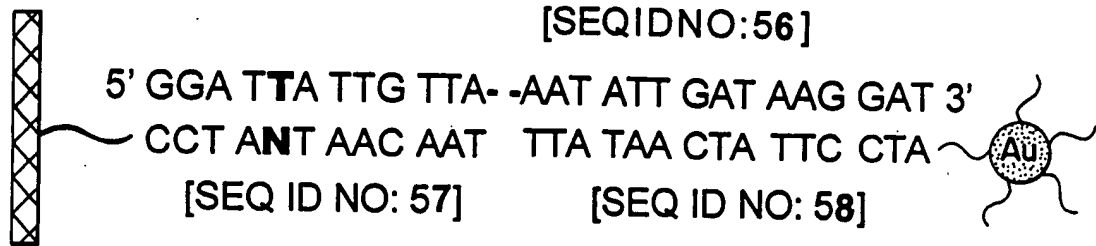


FIG. 31



# FIG. 32



**N** = A (complementary),  
G,C,T (mismatched)

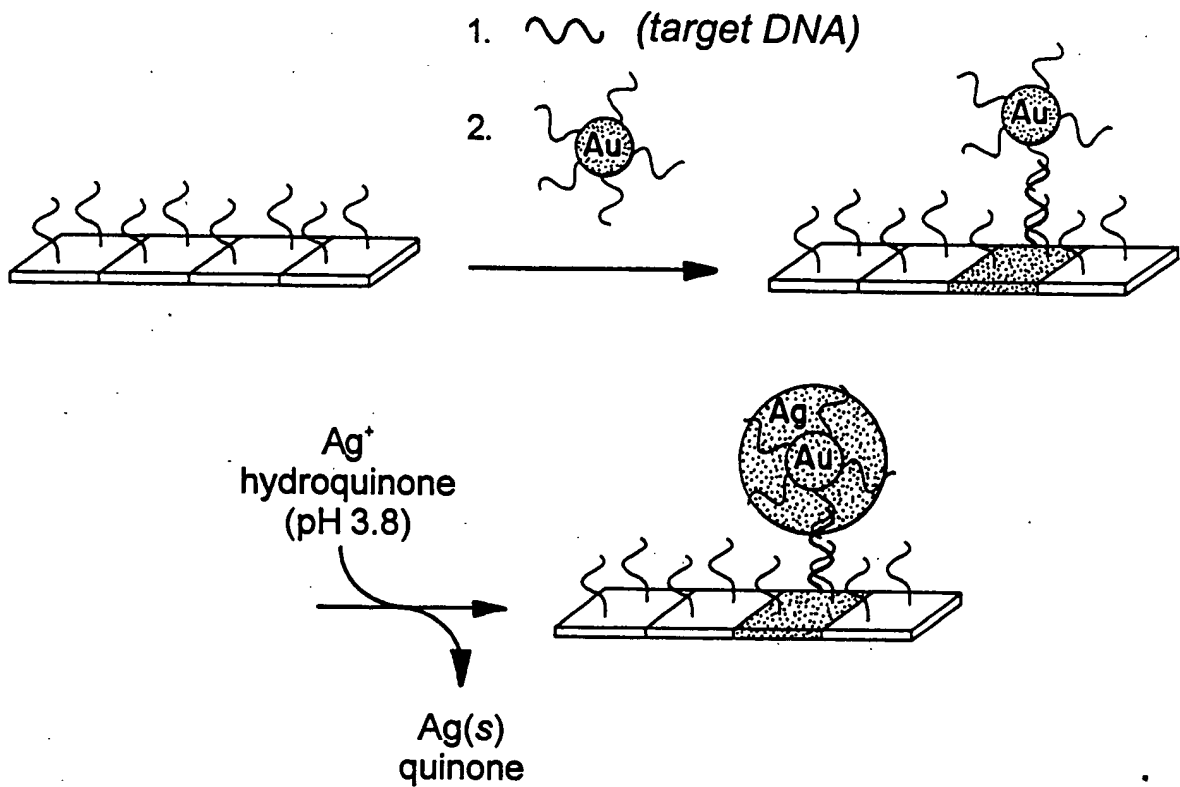


FIG. 33

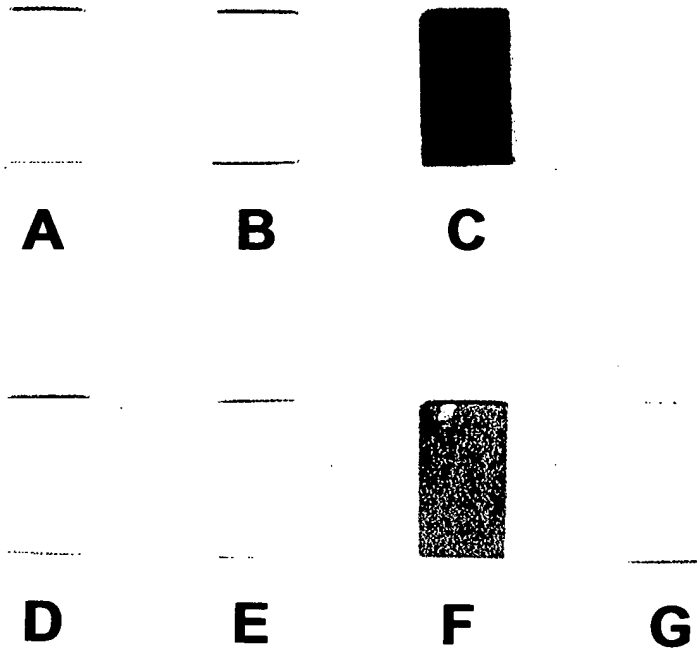


FIG. 34

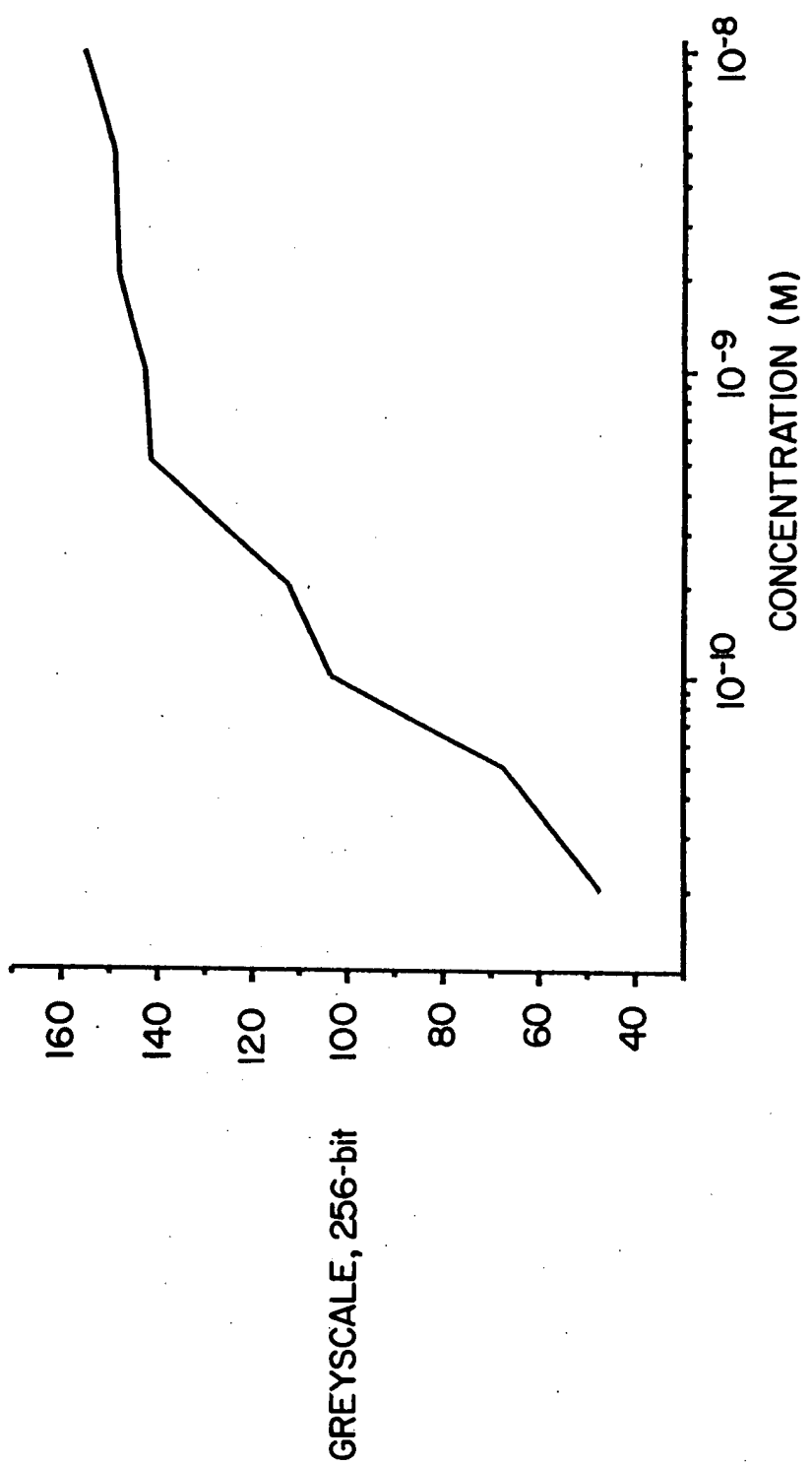




FIG.35A

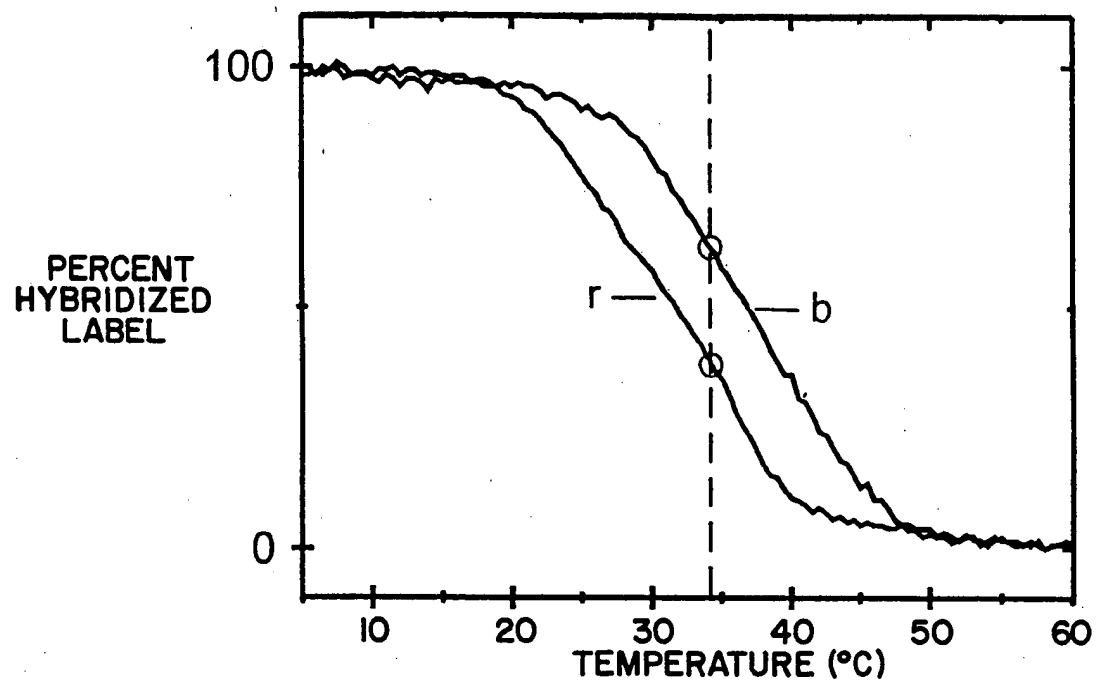


FIG.35B

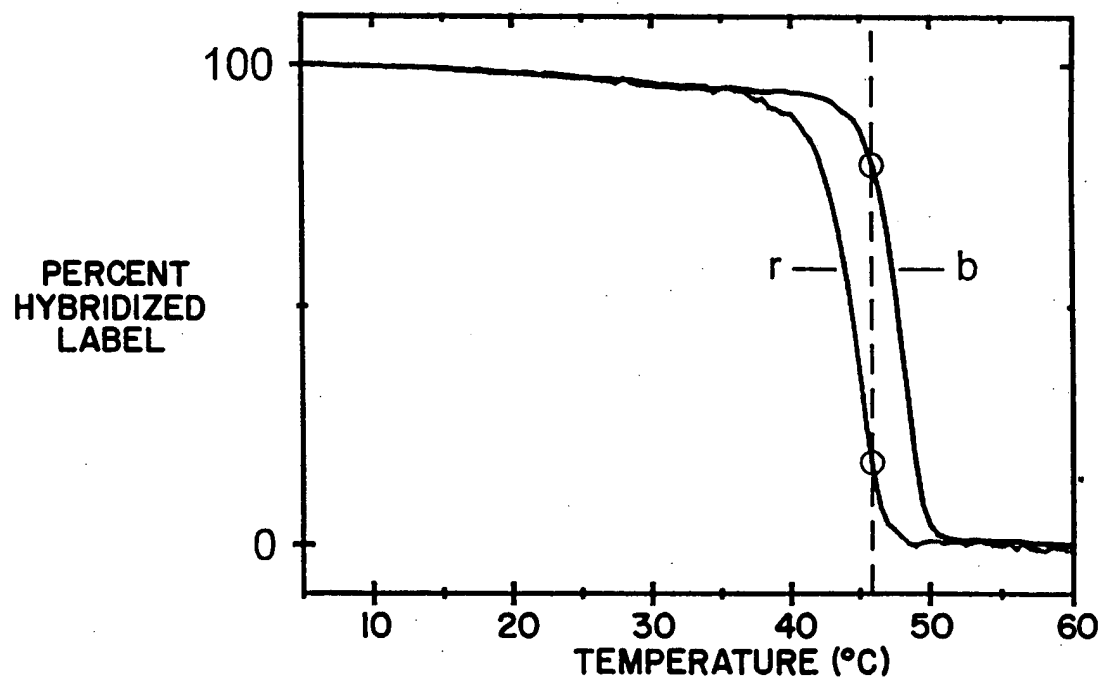


FIG. 36A



FIG. 36B



C A T G

FIG. 38A

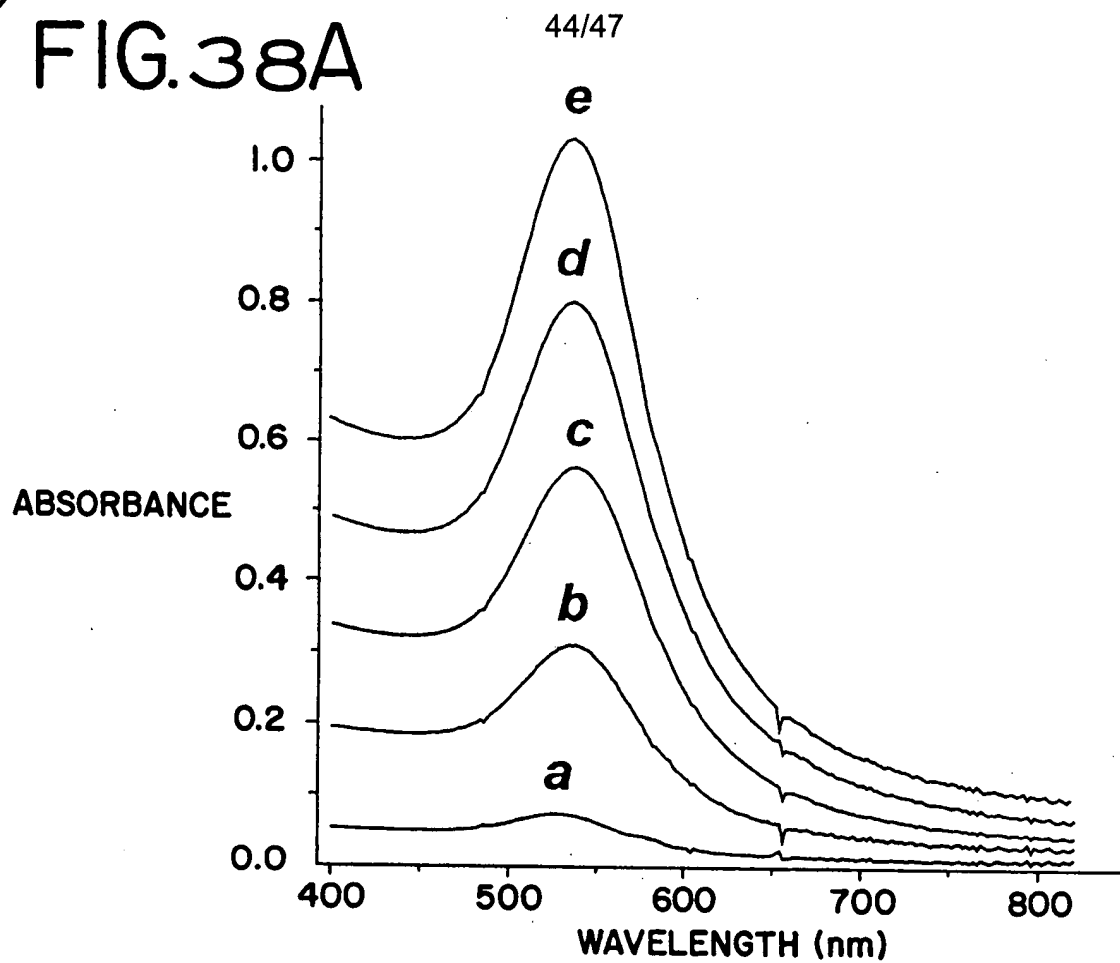


FIG. 38B

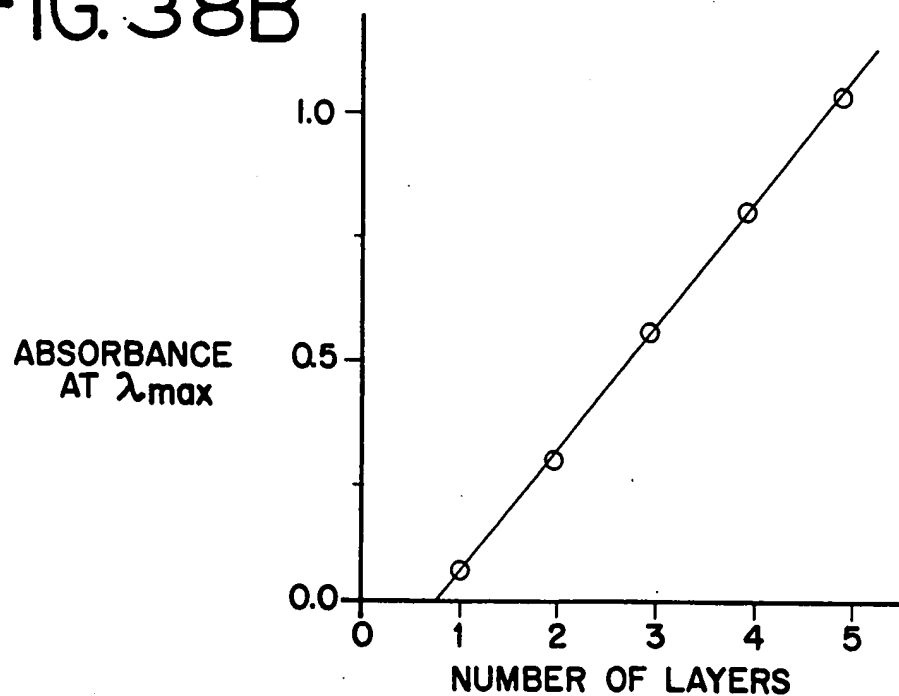


FIG.37A

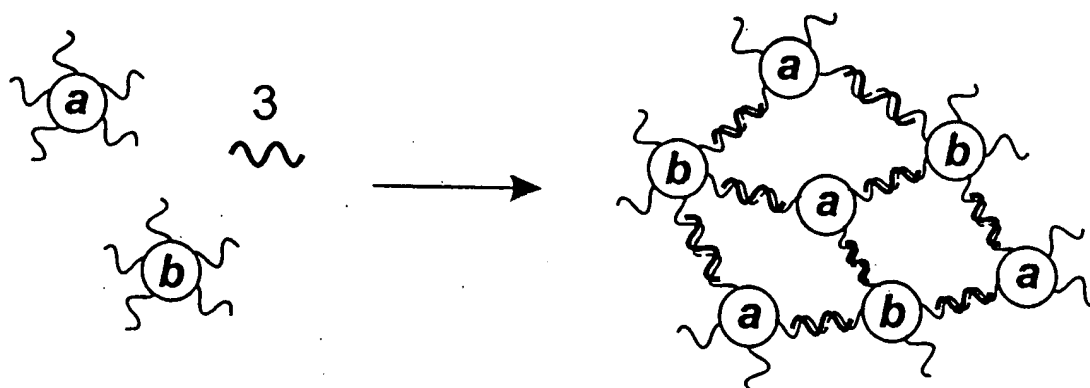


FIG.37B

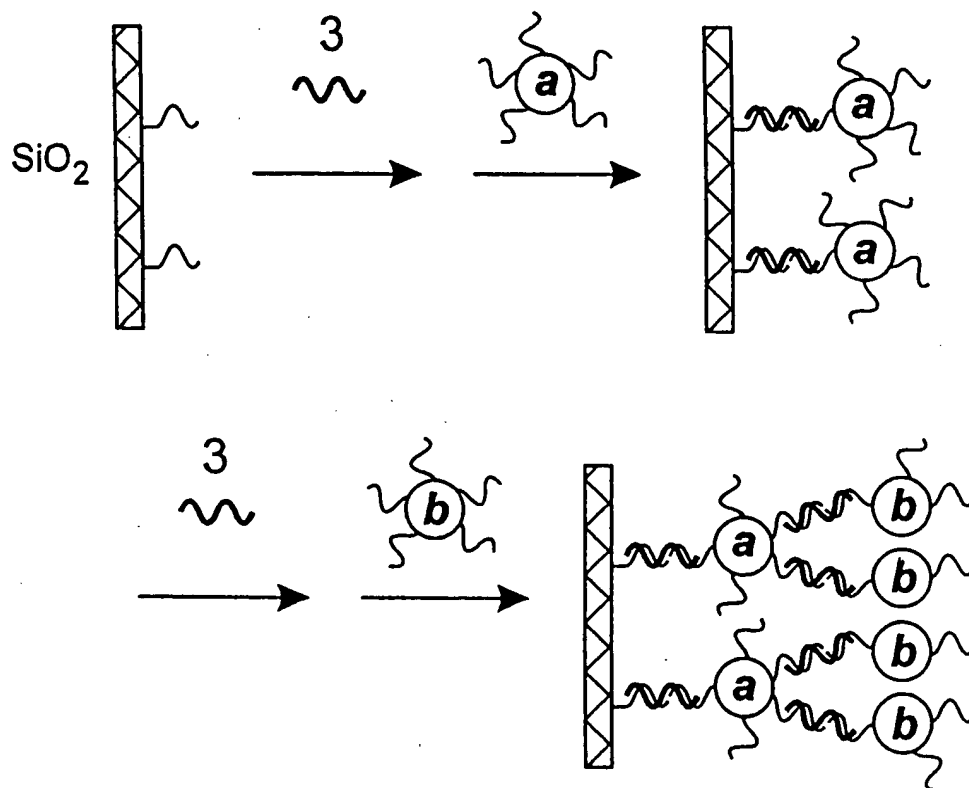


FIG. 39A

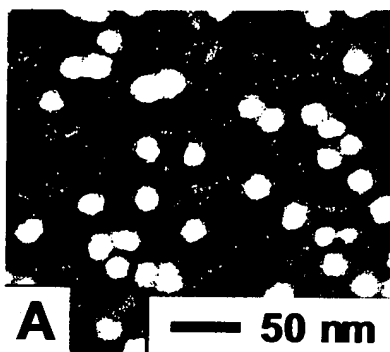


FIG. 39B

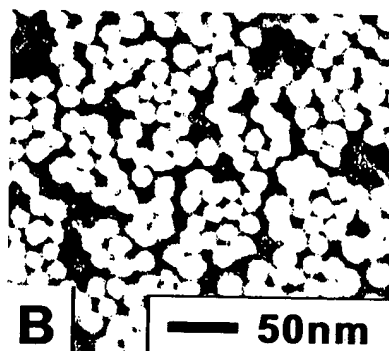


FIG.39C

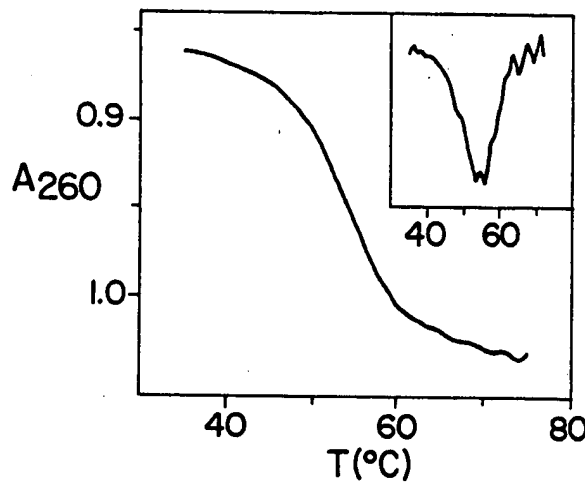


FIG.39D

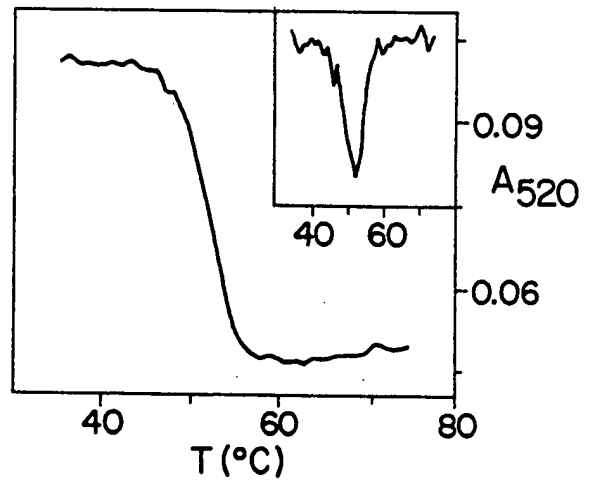


FIG.39E

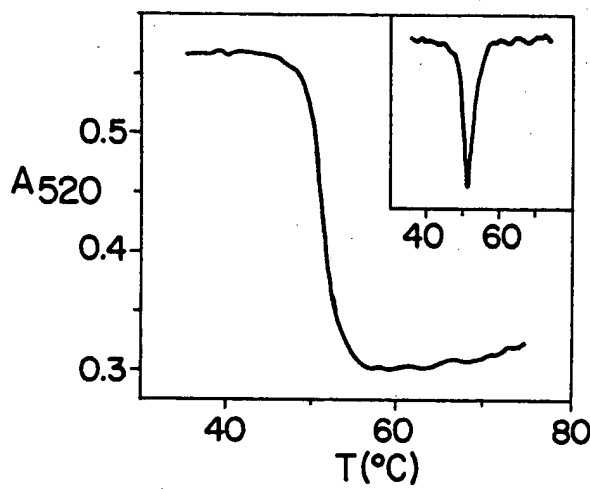


FIG.39F

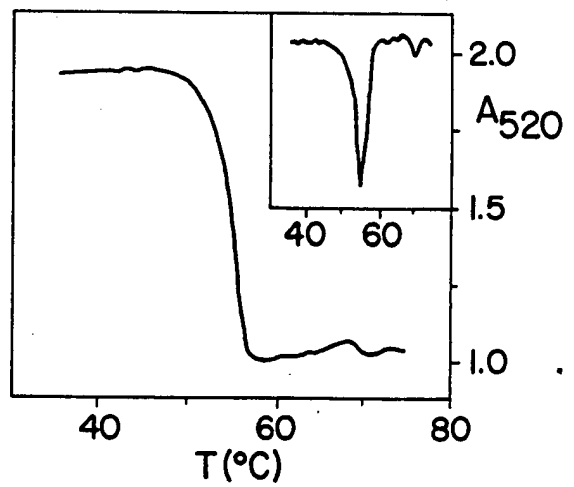


FIG. 40

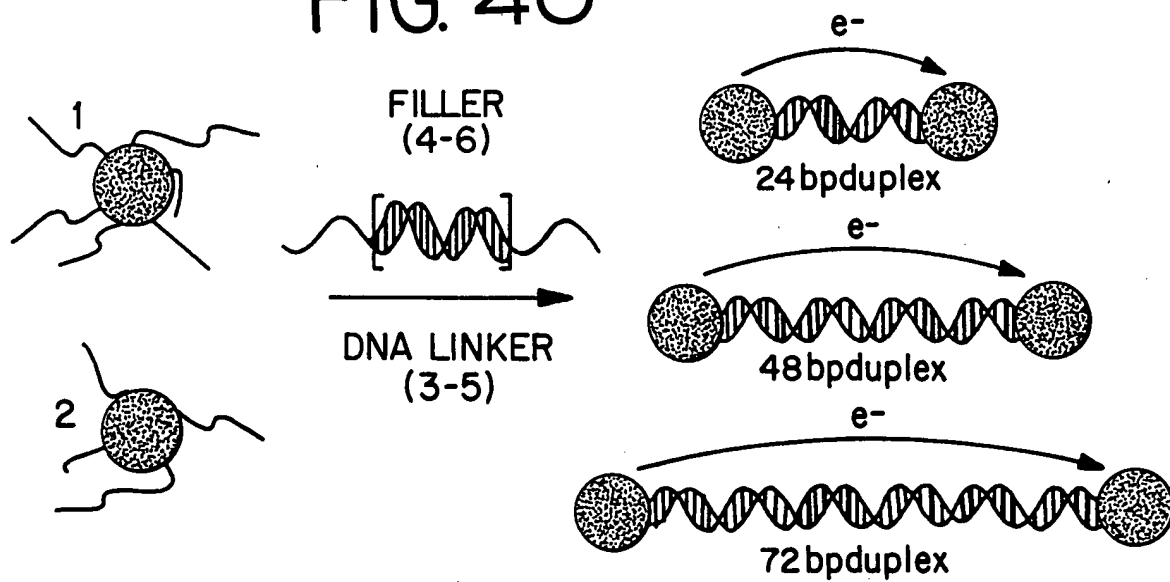


FIG. 41

